

4. D IDENTIFICATION AND PRIORITISATION OF ISSUES

4.1. D.1 OVERVIEW OF THE METHODOLOGY

4.1.1. Review of Relevant Information

The process used to identify and prioritise issues included:

- A preliminary site meeting between the proponents (represented by James and Geraldine Male), Alan Gundril – Manager, Environmental Services, Lockhart Shire Council, Birgit Ronnfeldt – Administration Planning Assistant, Lockhart Shire Council, Craig Bretherton - EPA Manager South West and Amanda Baldwin – EPA Regional Operations Officer was held on 1st December 2017.
- A review of applicable federal, state and local government acts, regulations, policies and plans.
- A review of applicable industry and environmental guidelines and online sources of information. A complete list of the references used to develop this EIS is provided in the reference list (section 9), with references used in Appendices provided in the reference lists for these.
- A site investigation by Robyn Tucker in the company of the proponents (represented by James Male and Kym Bissett).
- A site investigation (9th August 2018) and additional consultation with Mr Leonard Lyons and Mr Darryl Charles of the Wagga Wagga Aboriginal Land Council. A report was prepared and this is provided as Appendix G.
- A site investigation (14th February 2019) and additional consultation with Mr Mark Saddler of Bundiyi Aboriginal Cultural Knowledge. A detailed report was prepared and this is provided as Appendix H.
- The engagement of Water Technology to undertake a hydrogeological review of the proposal. The report is presented as Appendix E.
- The engagement of McMahon Earth Sciences to undertake soil testing as reported in Appendix B.
- Consultation with a range of state government bodies, Lockhart Shire Council and other relevant bodies as documented throughout this EIS.
- Reviewing recent EIS prepared to support NSW piggery applications.
- Following the Secretary's Environmental Assessment Requirements.
- A pre-lodgement meeting between the proponents (represented by Matt Klemke, Kym Bissett and James Male), Alan Gundril – Manager, Environmental Services, Lockhart Shire Council, Birgit Ronnfeldt – Administration Planning Assistant, Lockhart Shire Council and Robyn Tucker (LEAP Consulting) was held at the Lockhart Shire Offices on 22nd July 2019. Further consultation with David Webb, Director of Engineering & Environmental Services at Lockhart Shire Council was consulted about this proposal and indicated that he did not expect it would create any issues (pers. comm. 23rd July 2019).
- and Tracey Geppert, Environmental Officer at Lockhart Shire Council was consulted (23rd July 2019) followed that meeting.

4.1.2. D.1.b Outcome of Consultation with Stakeholders

In addition to the stakeholders mentioned in the previous section, consultation with all nearby neighbours was undertaken through informal discussions.

Neighbours raised concerns about:

- odour (house 1, house 2, house 6);
- potential impacts to property value (house 1, house 2, house 6);
- the standard of Semler's Lane for carrying increased numbers of heavy vehicles (house 1, house 2, house 6);
- impacts to groundwater supply (house 6); and
- the financial viability of the farm and whether corners would be cut during construction and management (house 1).

House 4 is owned by Matt Klemke, one of the owners of KBM Farms. House 3 is owned by Matt's mother; she is in favour of the development.

The owner of House 7 is very supportive of the piggery proposal. He is interested in working with the piggery to provide grain and straw and to take spent bedding compost.

The owner of House 5 declined the consultation opportunity but it is understood that they are not in favour of the proposed development.

The owners of houses 1, 2 and 6 are concerned about odour nuisance. Prevention of odour nuisance has been considered throughout this proposal. The proposal meets the separation distances required under the NSW government policy and provides additional separation distance beyond the minimum requirement (see section 5.2.2). This section includes a sensitivity analysis has been applied to provide additional confidence that neighbours will be protected from odour nuisance.

In particular, the staged nature of the proposed development means that the risk is able to be minimised. KBM Farms will not expand if the piggery is causing a confirmed odour nuisance until effective mitigation is in place. For instance, if odour becomes an issue at stage 2, the anaerobic pond could be covered at this point rather than waiting until stage 3.

In particular, the owners of house 2 are concerned that the odour will drift down the drainage line that runs to the north of the piggery and then east towards their house. To address this concern, a sensitivity analysis has been applied to the separation distance to this house by applying a different topographic factor (refer to section 5.2.2).

Concerns about possible impacts to property values are often raised in relation to intensive livestock developments. This proposal has assessed the potential for impacts to amenity and environmental impacts and included a range of practical mitigation techniques to prevent these from occurring. The proponents are confident that odour and visual impacts, in particular, can be managed to prevent any nuisance that could impact on property values. Hence, no impact is expected.

The owners of house 6 are concerned about possible impacts to groundwater availability. Their existing stock and domestic bore has a very low pump rate. They suggested that the piggery may

need an additional bore. This is addressed in Appendix E. The proponents will evaluate the need for an additional bore before each stage progresses.

The only house situated on Semler’s Lane is house 3, which is in support of the project. According to the proponents, the owners of the other homes rarely use this road. However, it is used regularly used for grain carting during harvest.

The proposed development will enhance the financial viability of the farm. It is proposed to construct a state-of-the-art facility and to operate it accordingly. Any concerns about financial viability and whether corners would be cut during construction and management are unfounded.

4.2. D.2 Outcomes of the Process

The identified issues and their priority are summarised in Table 44. Details are provided in section 5.

Table 44 – Identified Issues and their Priority

Issues identified	Priority
Cumulative impacts	Low
Odour Impact	High
Waste management	Medium-high
Water quality & catchment protection	Medium
Land capability & protection	Medium
Drainage and stormwater management	Medium
Flooding	Low
Traffic and road impacts	Medium
Noise	Medium
Dust	Medium
Visual impacts	Medium
Pest & insect control	Low
Flora and fauna	Medium
Heritage	Medium-high
Hazardous chemicals	Low
Animal welfare	Medium
Economic and social effects	Low

5. E THE ENVIRONMENTAL ISSUES

5.1. E.1 CUMULATIVE IMPACTS

5.1.1. E.1.a Baseline Conditions

Birgit Ronnfeldt, Administration Assistant, Planning at Lockhart Council was consulted about whether there were any intensive livestock facilities with development approval near the piggery site (pers. comm. 25th March 2019). She advised that there were no other intensive livestock facilities with development approval in the district, although there could be some temporary / drought feeding facilities. Such a facility is located some 1.85 km to the south-south-east of the property near house 4. It is owned by one of the owners of KBM Farm.

5.1.2. E.1.b Impact Analysis

As there are no other intensive livestock facilities near the proposed piggery site, there will be no cumulative impacts. It is worth noting that there are no houses between the temporary / drought feeding facility and the proposed piggery site.

5.1.3. E.1.c Mitigation, Management and Monitoring

As no cumulative impacts are expected, no mitigation, management or monitoring are required.

5.2. E.2. ODOUR

5.2.1. E.2.a Baseline Conditions

Odour levels for the subject property and surrounds are typical of those of any farming area. There will occasionally be odour from activities like herbicide spraying and from manure of confined stock. There are no nearby permanent intensive livestock facilities.

5.2.2. E.2.b Impact Analysis

Like any other intensive animal facility, the proposed piggery will create some odour. The most effective way of protecting amenity, particularly air quality, at nearby houses is by implementing good design, good management practices and appropriate separation distances. The Lockhart Shire DCP specifies a minimum buffer of 1000 m between a piggery and a house on other land, and 500 m for a house on the same land. The separation distance needed to protect amenity is a function of the size of the piggery, design and management features, type of receptor (e.g. house, rural residential, town etc), terrain, vegetation and wind patterns. Two methods have been used to assess the potential impact of odour on nearby sensitive land uses:

- Technical Notes Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales (Department of Environment and Conservation NSW, 2006)
- National Environmental Guidelines for Indoor Piggeries (Tucker, 2018)

Each of these methods include a variable separation distance methodology as their level 1 approach. In both cases, a clear pass at level 1 suggests a low risk of nuisance for the community. On 26th April 2018, Mr Craig Bretherton of the Environment Protection Authority was consulted regarding odour and dust. He advised that the level 1 methodology in the National Environmental Guidelines for Indoor Piggeries was suitable to use to assess odour impacts. With regard to dust, he indicated that it will be necessary to demonstrate that adequate controls are in place, although this is not expected to be a key issue.

Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales

The Technical Notes Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales (Department of Environment and Conservation NSW, 2006) (“the technical notes”) provide a variable separation distance formula to use in a Level 1 odour impact assessment for intensive piggeries. The objective of the impact assessment is to ensure that offensive odours do not cause unreasonable interference to the community. The variable separation distance formula takes the form:

$$D = \sqrt{N} \times 50 \times S$$

Where:

D = separation distance in metres between the closest points of the piggery and the most sensitive receptor or impact location

N = number of standard pig units. A standard pig unit (SPU) is defined as a grower pig of 26–60 kilograms live weight.

S = composite site factor = S1 x S2 x S3 x S4 x S5. Site factors S1, S2, S3, S4 and S5 are determined according to site-specific information relating to shed design, maintenance schedule, receptor, terrain, vegetation and wind factor

The technical notes use slightly different SPU factors than the National Environmental Guidelines for Indoor Piggeries (Tucker, 2018). The number of SPU for the proposed piggery, calculated using the technical notes SPU factors, is shown in Table 45. To best fit the weight ranges of the pigs to the Technical Methods categories, 1 week of finishers has been classed as heavy finishers and half the growers have been classed as finishers. The total SPU at stage 3 is 12,812 SPU, which is slightly less than the 13,331 SPU determined using the National Guidelines method. For this formula, $\sqrt{N} = 111.36$

Table 45 – SPU Numbers Using the Technical Notes Method

Pig Class	SPU Conversion	Stage 1		Stage 2		Stage 3		Housing
		Pig no.	SPU No.	Pig no.	SPU No.	Pig no.	SPU No.	
Lactating sows	2.5	94	235	140	350	187	467.5	Conventional
Gestating sows	1.8	506	910.8	759	1366.2	1012	1821.6	Deep litter
Gilt	1.8	41	73.8	62	111.6	83	149.4	Deep litter
Boar	1.6	4	6.4	6	9.6	8	12.8	Deep litter
Heavy finisher	1.8	254	457.2	382	687.6	509	916.2	Conventional
Finisher	1.6	1275	2040	1913	3060.8	2550	4080	Conventional
Grower	1	1548	1548	2322	2322	3096	3096	Deep litter
Weaner	0.5	1651	825.5	2477	1238.5	3302	1651	Deep litter
Suckers/early weaners	0.1	1033	103.3	1549	154.9	2065	206.5	Conventional
Total	-	6406	6200	9610	9301	12812	12401	-

The size and design features of the piggery have been discussed in sections 2.1.1 and 2.1.4. Best practice design and management will be adopted. The NSW technical notes do not include a factor for a covered pond. However, covering the primary anaerobic pond at Stage 3 is expected to substantially reduce the odour from the piggery. For example, (Smith RJ, Dalton P and DeBruyn N, 1999) concluded that manure treatment lagoons are the major source of odour at typical Australian piggeries, producing about 75% of all emitted odour. (Camp Scott Furphy Pty Ltd, 1993) similarly concluded that 82% of odour emissions from a NSW piggery originated from uncovered manure treatment lagoons. The odorous gases captured under impermeable pond covers are destroyed when the biogas is burnt as a fuel. According to Impermeable lagoon covers can reduce odour emitted by a lagoon by 95% (Stenglein RM, Clanton CJ, Schmidt DR, Jacobson LD and Janni KA, 2011).

For S1, odour potential factor, the following factors were used:

A. Partly slatted floor and 'pull plug' and recharge system	0.6
B. Limited ridge and side ventilators (or side only) or limited forced (fan) ventilation	1.0
C. Faeces, urine and other biological materials removed from the confines of the building every 24 hours or less often	1.0
D. Anaerobic lagoon	1.0
E. Phase feeding with optimal protein	0.8

The product of these values is 0.48. The methodology specifies that the S1 factor can be no lower than 0.5, hence this is the adopted value.

For litter-based systems stocked at recommended rates with good management practices, the S1 factor is 0.5.

Hence, the S1 factor across the whole piggery is 0.5.

The S2, or receptor type, factor includes the following categories and multipliers:

Large town >2000 persons	1.6
Medium town 500-2000 persons	1.2
Medium town 125-500 persons	1.1
Small town 30-125 persons	1
Small town 10-30 persons	0.6
Single rural residence	0.3
Public Area (occasional use)	0.05

The terrain between the piggery site and nearby houses impacts odour dispersion. Elevation transects between the piggery complex and each house are provided as Figure 42 to Figure 48. These provide an indication of the intervening topography. The following conclusions can be drawn about the topography between the piggery complex and each house:

- House 1 (Figure 42): the land has some gentle undulations, the house is at a higher elevation than the piggery complex. There are clumps of roadside trees between the site and the house.

- House 2 (Figure 43 and Photograph 7): the land has some gentle undulations, the house is at a similar elevation to the piggery complex. There are some trees between the piggery site and the house.
- House 3 (Figure 44 and Photograph 8): the land has some gentle undulations. The house is at a slightly higher elevation than the piggery and there is a low rise between the piggery complex and the house. Note: this house is owned by the mother of one of the owners of KBM Farms.
- House 4 (Figure 45): there is a steady slope up to the house. Note: this house is owned by one of the owners of KBM Farms and is therefore not a receptor.
- House 5 (Figure 46): there is generally a steady slope up to the house with some undulations between the piggery complex and the house.
- House 6 (Figure 47): there is a steady slope up to the house which is at a significantly higher elevation than the piggery site.
- House 7 (Figure 48): there is a steady slope up to the house which is at a significantly higher elevation than the piggery site.

The S3 factor covers terrain. In this case, all of the houses will be covered by flat which includes slopes of up to 10% upslope and 2% downslope and not within a valley drainage zone.

Although there are scattered trees between the site and some houses, the vegetation has mostly been cleared for cropping so an S4 factor of 1 for crops has been adopted for all receptor classes.

The wind patterns for the site are described in section 3.3.4. A wind frequency factor (S5) of 1 for normal wind conditions has been adopted.

The required and available separation distances between the piggery site and the different types of receptors are shown in Table 46.

Table 46 – Required and Available Separation Distances to Receptors – NSW Method

Receptor Category	Distance (m)	Available distance (m)
Large town >2000 persons	4454 m	Wagga Wagga >40 km
Medium town 500-2000 persons	3341 m	Henty >16 km
Medium town 125-500 persons	3062 m	Pleasant Hills >10 km
Small town 30-125 persons	2784 m	-
Small town 10-30 persons	1670 m	Wrathall ~4500 m
Single rural residence	835 m	House 1~1500 m House 3 ~1600 m* House 7 ~1750 m
Public Area (occasional use)	139 m	Pleasant Hills Public School > 10 km

*House 3 is owned by the mother of one of the owners of KBM Farms.

In all cases there is adequate separation distance to protect amenity.

As a form of sensitivity analysis, the S1 factor has been adjusted to reflect lower management than what is proposed, and the minimum separation distance to a house recalculated. For the pigs in

conventional sheds, S1 part E has been changed from “phase feeding with optimal protein” (0.8) to “phase feeding” (0.9). For the deep litter shelters, the factor has been changed from recommended stocking rates with good management (0.5) to higher densities and / or without good management (0.75). This changes the value for the pigs in conventional housing to 0.54, although it is noted that this is very conservative considering there is no allowance for the odour suppression of the covered pond. With 5670.2 SPU in conventional sheds (45.72%), the contribution of these pigs to the overall S1 factor is 0.2468. The remaining 6730.8 SPU (54.27%) are in deep litter and the contribution of these pigs to the overall S1 factor is 0.4070. Hence, the overall S1 factor changes to 0.6538. When this is factored into the separation distance equation, the separation distance to the houses becomes:

$$\begin{aligned} \text{Distance (D) (m)} &= \sqrt{12,401 \times 50 \times (0.6538 \times 0.3 \times 1 \times 1 \times 1)} \\ \text{D (m)} &= 111.36 \times 50 \times 0.1961 = 1092 \text{ m} \end{aligned}$$

The owner of house 2 has raised concerns about odour drifting from the piggery down the waterway some 110 m to the north of his house and remaining concentrated. A sensitivity analysis, using the original S1, S2, S4 and S5 factors with S3 set to valley drainage (2.0), was used to investigate the possible effect of this. For house 2, the formula becomes:

$$\text{Distance (D) (m)} = 111.36 \times 50 \times 0.3 = 1670 \text{ m}$$

The house is not in a valley drainage situation. However, applying the higher S1 factor (0.6538) with valley drainage (2.0) for house 2, the formula becomes:

$$\text{Distance (D) (m)} = 111.36 \times 50 \times (0.6538 \times 0.3 \times 2 \times 1 \times 1) = 2184 \text{ m}$$

Note that this can be considered a very conservative test of the likely impact. The available separation distance to the house is approximately 2220 m. Hence, this house should be well protected from odour.

National Environmental Guidelines for Indoor Piggeries

The National Environmental Guidelines for Indoor Piggeries also provide a variable separation distance methodology for determining suitable separation distances to neighbours which provides an additional sensitivity analysis. The Level 1 approach, also a variable separation distance formula, has been applied. This approach is quite conservative and offers a high level of protection for community amenity. Level 2 and 3 odour modelling has not been conducted as no receptors fell within the recommended separation distance determined using the Level 1 methodology. The National Environmental Guidelines for Indoor Piggeries note that: “If a piggery can demonstrate a clear pass at Level 1 odour assessment, there is no need to undertake Level 2 or 3 assessment, regardless of the size of the development, unless there are special risk factors.”

The formula is:

$$\text{Separation distance (D) m} = N^{0.55} \times S1 \times S2 \times S3$$

The following values have been used in the determination:

S1R	conventional sheds	1.0
S1R	deep litter, bedding on single batch of litter ≤7 weeks	0.63

S1T	impermeable pond cover	0.5
S1T	deep litter – spent bedding stockpiled / composted on-site	0.63
S2R	town	25
	rural residential	15
	rural dwelling	11.5
S2S	limited groundcover / short grass	1.0
S3	flat	1.0
	gently sloping (receptor upslope)	1.0

Working on the herd composition and housing data provided for Stage 3 in Table 1, there will be 7238 SPU in conventional housing and 5892 SPU on deep litter.

The combined S1R factor is $((7238/13,130) \times 1) + ((5892/13,130) \times 0.63) = 0.833965$. The combined S1T value is $((7238/13,130) \times 0.5) + ((5892/13,130) \times 0.63) = 0.558337$. Hence, the combined S1 factor is 0.465633.

Although there are scattered trees between the site and some houses, the vegetation has mostly been cleared for cropping so an S2S factor of 1 has been adopted for all receptor classes. Consequently, the combined S2 factors are 25 for a town, 15 for rural residential and 11.5 for a house.

For all of the houses an S3 weighting of 1 for flat or gently sloping land with the receptor upslope is applicable.

Using this method, the required separation distance between the piggery site and the various classes of receptor are shown in Table 47.

The closest rural residential area and town (Pleasant Hills) are over 10 km from the site. Assuming the intervening topography is flat and the vegetation is limited groundcover / short required, the required separation distances are 1286 m to a rural residential area and 2143 m to a town.

The required and available separation distances between the piggery site and the different types of receptors are shown in Table 46.

Table 47 – Required and Available Separation Distances to Receptors – National Guidelines Method

Receptor Category	Distance (m)	Available distance (m)
Town	2143 m	> 10 km to Pleasant Hills
Rural Residential	1286 m	> 10 km to Pleasant Hills
Legal house	986 m	House 1 ~1550 m House 3 ~1615 m*

*House 3 is owned by the mother of one of the owners of KBM Farms.

In all cases there is adequate separation distance to protect amenity.

Predominant wind direction also plays a role in determining odour dispersion. From section 3.3.4, at 9 AM winds are predominantly from the east to north-east in summer and the east in winter while at 3 PM winds are predominantly from the west to south-west throughout the year. There are no close houses at all to the north-east, or to the north-west, west or south-west of the site. Hence, most of the time winds won't be carrying directly towards houses. The afternoon winds from the west will tend to carry towards house 2. Fortunately, this house is over 2 km from the boundary of the piggery complex with undulating intervening topography that will assist in promoting odour dispersion.

People living near piggeries have the right to comfortable enjoyment of life and property. However, when nuisance does occur, it can significantly disrupt this amenity. The analysis provided above suggests that odour from the proposed piggery should not cause nuisance. Nevertheless, because it is a very sensitive issue and a concern raised by some neighbours, odour has therefore been identified as a high priority in Table 44, warranting careful mitigation, management and monitoring.

5.2.3. E.2.c Mitigation, Management and Monitoring

The piggery will be a modern facility incorporating best management practices and design which will optimise hygiene and mitigate odour from the piggery complex. This includes:

- fitting dust extractors to the feedmill equipment
- smooth surfaces within housing that are easy to clean
- selection of feeders that minimise feed wastage
- phase feeding with optimal protein to minimise organic matter and nutrients to effluent
- use of pelleted feed for suckers and weaners and liquid feed for growers and finishers
- pull plug effluent pits to minimise effluent production and promotes complete emptying of pits
- regular emptying of the effluent pits in series to keep a consistent flow of effluent to the anaerobic pond (necessary to maintain the food supply for the treatment microorganisms)
- properly sized effluent treatment ponds
- covering of the anaerobic pond at stage 3 – this significantly reduces odour generation
- using plenty of bedding in the deep litter shelters and replacing this frequently (at least every seven weeks).
- composting spent bedding and separated solids
- composting mortalities with good cover maintained over the bodies at all times.
- low pressure spray irrigation of effluent from a height of less than 2 m above the ground; this minimises aerosol formation and drift.

Odour nuisance at piggeries can sometimes result from activities that are unfrequently undertaken or at locations away from the piggery complex, like effluent and compost spreading. To mitigate potential odour nuisance from these activities, effluent and compost will be:

- spread frequently to minimise the likelihood of large, odour generation events
- distributed evenly over the land
- applied from mid-morning to mid-afternoon when the air is warming, rather than early in the morning or late in the afternoon when odour may be trapped under cool air
- spread close to the ground
- Incorporated if necessary.

Effluent and compost will not be irrigated / spread when:

- when the wind is blowing directly towards a nearby house or public area
- the material (compost) is very dry and dusty and spreading could result in dust being carried to nearby houses or public areas
- there is heavy cloud or rain is expected later that day
- close to nearby houses or public areas just before, or on, public holidays or weekends when neighbours are more likely to be home.

Where a particularly odorous activity is to be undertaken, for example pond desludging, KBM Farms will consult with the closest neighbours beforehand so they are aware of what is happening and can have input into the timing.

The proposed location of the piggery complex provides the recommended separation distances to neighbouring houses and communities, with additional buffer. This providing a high degree of confidence that no nearby residences will be affected by odour nuisance. The staged nature of the proposal provides extra comfort as the facility will start small and gradually increase to in size to full capacity.

An odour management process will be implemented at the piggery, whereby complaints will be managed by:

- talking with the complainant about the issue with the aim of finding out what the problem is, what date and time it occurred, how long the nuisance lasted, whether the complainant can help identify the cause and any other useful information.
- investigating possible causes by considering what activities were being undertaken (including where and when) and the weather conditions at the time the nuisance occurred.
- gathering evidence and identifying and implementing strategies to remedy the problem and prevent it from happening again.
- talking with the complainant about the identified cause and the corrective and / or preventative actions taken and asking the complainant if the issues is now resolved. (If not, repeat the process).
- recording all details of the complaint, the investigation, actions taken and the communication with neighbours.
- monitoring the effectiveness of the implemented strategies on an ongoing basis and adjusting if necessary.

Liaison with council and EPA will also be important in resolving odour nuisance issues. As many odour nuisance incidents are closely related to weather conditions, it is proposed that an on-site automatic weather station will be installed at stage 3. This would assist in evaluating odour complaints and identifying the underlying cause.

5.3. E.3 WASTE MANAGEMENT

5.3.1. E.3.a Baseline Conditions

Wastes (e.g. manure and effluent), have not been used on the farm to date.

5.3.2. E.3.b Impact Analysis

The piggery has been planned with an emphasis on waste minimisation. For example:

- diets will be formulated to meet the nutritional needs of each class of stock (phase feeding with optimal protein),
- low wastage feeders will be used,
- low wastage drinkers will be used,
- pull plugs, which use considerably less water than flush channels, will be installed in the conventional sheds, and
- effluent and manure (compost) will be reused as valuable inputs to the farming system.

The effluent treatment system has been designed to ensure all wastewater is effectively contained and treated:

- the area beneath the screw press separator will have a low permeability base (1×10^{-9} m/s permeability), with bunding to prevent ingress of stormwater or uncontrolled releases of effluent
- the effluent ponds have been sized based on the effluent volume and composition. They will have impermeable bases (1×10^{-9} m/s permeability), above-ground banks to prevent stormwater ingress, and a design spill frequency of 1 in 10 years and also able to contain the 1 in 20 year, 24 hour storm.
- effluent will be directed into the anaerobic ponds regularly to ensure stable function is maintained.
- the anaerobic pond will be covered at stage 3 to allow for the collection of biogas that can be used to generate heat and power for use within the piggery. This will also significantly reduce the odour and greenhouse gas emissions of the piggery.

The composting pad has also been designed to ensure the environment is protected:

- it has been sized to manage the expected volume of spent bedding and separated solids from the piggery.
- the composting material will be regularly turned and watered with treated effluent to maintain the optimal moisture content and enhance the composting process.
- the pad will be constructed for a low permeability (1×10^{-9} m/s permeability) and bunded to prevent ingress of extraneous stormwater and to control drainage water from the area. All water captured within the composting area will be directed into the holding pond, which is sized to take this inflow.
- The whole piggery complex will sit within a controlled drainage area.

Wastewater from staff amenities will be treated using a septic system and soakage trench.

Additionally, the whole piggery complex will sit within a controlled drainage area.

It is intended that effluent and compost will be cropping inputs on farms owned by the owners of KBM Farms, replacing part of the synthetic fertiliser currently in use but may also be offered to nearby landholders as cropping system inputs. It is expected that the nutrients and organic matter in these products will enhance soil structure, water holding capacity and nutrient quality.

Practices that will be used will include:

- spreading the nutrients in the effluent and compost at sustainable rates, with the aim of ensuring applied nutrients can be removed by crop harvest.
- regularly testing the soils of reuse areas to confirm that soil nutrients are at suitable levels that won't put the quality of soil, runoff water or groundwater at risk.
- providing suitable buffers to waterways and sensitive native vegetation.
- using good farming practices (e.g. reduced till).

The piggery will generate very little rubbish. Pig feed commodities will be mostly delivered in bulk and without packaging. There will be some pharmaceutical and cleaning product packaging and some office wastes. No on-farm waste disposal areas are planned. Wastes that cannot be practically recycled will be collected in skips and the contents dispatched to off-farm waste facilities. Sharps will be collected in suitable containers for disposal through an appropriate facility.

5.3.3. E.2.c Mitigation, Management and Monitoring

The reuse of effluent and compost in the farming system is expected to enhance soil properties. However, it will be important to ensure nutrients are applied at sustainable rates. For each paddock on the piggery property and the Munyabla, Urana and Yerong Creek farms, the owners of KBM Farms will calculate reuse rates based on the nutrient content of the effluent and compost, soil properties (excesses or deficits of nitrogen, phosphorus and potassium), and the expected nutrient uptake of the crops to be grown. Soil monitoring is described in section 7.2. Where compost is provided to other farmers, they will be provided with a recent analysis and directed to use the Australian Pork Limited (Tucker, RW, 2015) "Piggery Manure and Effluent Reuse Glovebox Guide" to calculate spreading rates. This guide can be accessed on-line at: http://australianpork.com.au/wp-content/uploads/2013/10/pocket-guide_08.pdf. They will also be made aware of the need to provide buffers to sensitive areas as per Table 18.

The proposal is reliant on land owned by Matt Klemke for reuse of effluent and mortalities compost. Matt is prepared to enter into a 20 year lease of this land back to KBM farms to ensure this land is secure and available to KBM Farms for the expected lifespan of the piggery.

5.4. E.4 WATER QUALITY AND CATCHMENT PROTECTION

5.4.1. E.4.a Baseline Conditions

There are no watercourses through the lot on which the piggery will be situated. However, Mittagong Creek does pass through parts of the Munyabla farm designated for reuse. Figure 34 shows waterways in the district. Figure 35 shows local waterways including Mittagong Creek and Mundawaddy Creek, which are both intermittent creeks. The Lockhart Shire State of the Environment Report 1 July 2019 to 30 June 2017 (Lockhart Shire Council, 2017) identifies that when these creeks do flow, water clarity is very poor due to eroded soil entering in runoff and the moving sediment load of the streams.

In the vicinity of the property, groundwater is mainly found within unconfined fractured rock aquifers at depths exceeding 35 m. There may be some minor, seasonally perched groundwater in colluvial and alluvial sediments. Aquifer recharge is likely localised along drainage lines and areas where bedrock is exposed; these areas are not included in reuse areas. It is unlikely that there are

any groundwater dependent ecosystems associated with the local groundwater system. On the limited data available, groundwater salinity locally is about 2300 mg TDS/L which is an EC of about 4100 $\mu\text{S}/\text{cm}$.

Flooding of the Urana farm is discussed in section 3.3.1. The farm is flood-prone, although the flooding frequency is likely to be well below the 1 in 5 year incidence. The National Environmental Guidelines for Indoor Piggeries indicate that piggery reuse areas should be above the 1 in 5 year flood level. The Environmental Guidelines: Use of Effluent by Irrigation (NSW Department of Environment and Conservation, 2004) and the Effluent Management Guidelines for Intensive Piggeries in Australia (ARMCANZ and ANZECC, 1991) do not specify a particular flood frequency for reuse areas, suggesting the use of a risk assessment approach. The farm is expected to satisfy the national guidelines criteria. Only reuse of compost is proposed for the farm. In lieu of this, the use of inorganic fertiliser (only) would continue. The use of properly produced compost would not pose any greater environmental or public health risk than fertiliser.

5.4.2. E.4.b Impact Analysis

Water quality objectives have been specified for the Murrumbidgee River (NSW Office of Environment, ND). The subject property fits in the category for uncontrolled streams and the Lake George catchment. The water quality objectives are to protect:

- aquatic ecosystems
- visual amenity
- secondary contact recreation
- primary contact recreation
- livestock water supply
- irrigation water supply
- homestead water supply
- drinking water at point of supply – disinfection only
- drinking water at point of supply – clarification and disinfection
- drinking water at point of supply – groundwater
- aquatic foods (cooked).

River flow objectives are also specified but these are less relevant since surface water will not be used in the proposed piggery.

The NSW Groundwater Quality Protection Policy (Department of Land & Water Conservation, 1998) aims to manage the state's groundwater resources so that they can sustain environmental, social and economic uses for the people of NSW. It is policy of the NSW Government to encourage the ecologically sustainable management of the State's groundwater resources so as to:

- slow and halt, or reverse any degradation of groundwater resources;
- ensure sustainability of groundwater dependent ecosystems;
- maintain the full range of beneficial uses of these resources;
- maximise economic benefit to the region, state and nation;

The policy objectives are:

1. all groundwater systems should be managed such that their most sensitive identified beneficial use (or environmental value) is maintained.
2. town water supplies should be afforded special protection against contamination.
3. groundwater pollution should be prevented so that future remediation is not required.
4. for new developments, the scale and scope of work required to demonstrate adequate groundwater protection shall be commensurate with the risk the development poses to the groundwater system and the value of the groundwater resource.
5. A groundwater pumper shall bear the responsibility for environmental damage or degradation caused by using groundwaters that are incompatible with soil, vegetation or receiving waters.
6. Groundwater dependent ecosystems will be afforded protection.
7. Groundwater quality protection should be integrated with the management of groundwater quantity.
8. The cumulative impacts of the developments on groundwater quality should be recognised by all those who manage, use or impact on the resource.
9. Where possible and practical, environmentally degraded areas should be rehabilitated and their ecosystem support functions restored.

No impacts to surface water or groundwater quality from the piggery complex are expected because:

- there are no waterways on the subject property.
- shallow groundwater is not present beneath the piggery site.
- all sheds will have a concreted base. There will be no ingress of stormwater into the sheds and no uncontrolled releases of effluent.
- the area under the screen or screw press and the manure and mortalities composting area will be impervious (1×10^{-9} m/s permeability) and bunded with all leachate and stormwater caught within these areas directed to the effluent treatment system.
- the effluent pond system, which will capture all effluent from the piggery itself as well as runoff from the manure and mortalities composting area, has been designed for an average spill frequency of 1 in 10 years, and is also able to contain the 1 in 20 year, 24 hour storm. The base of the ponds will be impervious (1×10^{-9} m/s permeability).
- additionally, the piggery complex will sit within a controlled drainage area. Runoff caught within this area will drain to the north and will be absorbed by the landscaping buffer which will be planted with species that are tolerant of seasonal waterlogging.

Consequently, for surface waters, there will be no impacts on primary or secondary contact, water supply or aquatic foods (cooked) from the piggery directly. For groundwater, all beneficial uses will be protected and groundwater pollution will be prevented.

Reuse practices have also been designed to protect surface water and groundwater quality. These include:

- selecting soil that is suitable for cropping (arable land, low slope, no major impediments to crop production) for reuse
- applying nutrients in effluent and compost at rates determined from soil nutrient levels and expected crop harvest removals.
- providing suitable buffers between reuse areas and watercourses.
- using practices that minimise soil erosion e.g. minimum tillage.

- maintaining buffers between reuse areas and waterways.
- monitoring effluent, compost and soil nutrient levels and adjusting reuse rates to ensure soil nutrient levels do not exceed good agronomic levels.

These measures will offer a good protection of soil, surface water and groundwater.

5.4.3. AE.4.c Mitigation, Management and Monitoring

The mitigation and management measures detailed in section 5.4.2 are sufficient to ensure good protection of both surface water and groundwater. Given the environmental controls proposed for within the piggery complex, the only risk area would be the reuse areas. However, these are unlikely to pose a significant risk to surface water or groundwater due to the good nutrient management and agronomic practices proposed, and the buffers between reuse areas and waterways that will filter and absorb runoff.

As the nearby watercourses are intermittent and tend to carry a high sediment load, there is little point in monitoring water quality in these. Similarly, the depth to groundwater and localised nature of recharge means monitoring is unlikely to detect impacts. Nevertheless, direct and regular monitoring of the topsoil and subsoil of these areas will detect risks to surface waters and groundwater respectively before there is a water quality issue.

5.5. E.5 LAND CAPABILITY AND PROTECTION

5.5.1. E.5.a Baseline Conditions

Section 3.3.3 of this EIS summarises the main findings of a soil survey and assessment of the proposed piggery site undertaken by McMahon Earth Sciences in East Wagga Wagga. While the survey did not cover all reuse areas, including the effluent reuse area, it does provide useful baseline data. The two soil types encountered were chromosols and sodosols.

The chromosols had a dark, moderately deep, friable clay loam organic surface layer that was underlain by a harder clayey, structured subsurface horizon that was neither strongly acidic nor sodic but is low in organic matter. The soils were non-cracking, non-dispersive, well-drained and aerated. It was noted that the favourable physical properties of the soils make them suitable for the reuse of compost.

The sodosols consisted of soils with a darker moderately deep, friable clay loam organic surface layer underlain by a harder clayey, structured subsurface horizon that is not strongly acidic but is sodic. Like the chromosols, these soils were non-cracking, well-drained and aerated. While the topsoil was non-dispersive, the subsoils were low in organic matter and dispersion testing suggested that they could be sodic. Nevertheless, the favourable physical properties of the soils make them suitable for reuse of compost.

McMahon Earth Sciences tested the soils and compared the analysis results with the indicators of sustainability provided in "Use of Effluent by Irrigation" (NSW Department of Environment and Conservation, 2004). The only moderate limitation was an acidic topsoil and, in some cases, a relatively low CEC that can be addressed by soil amelioration.

Based on the Soil Landscapes of the Wagga Wagga 1:100,000 sheet, (Chen XY and McKane DJ, 1996), the other reuse area on the Munyabla farm are also likely to be chromosols and sodosols on similar

landscapes with very gently to gently undulating plains. Limitations could include localised erosion hazard and waterlogging, hard setting and strong acidity.

Soil testing was not undertaken on the Urana and Yerong Creek farms. However, the areas allocated for reuse on these farms have been cropped for many years and the soil types are considered suitable for this purpose.

5.5.2. E.5.b Impact Analysis

Irrigation of effluent onto the soil will add organic matter which will help to improve soil structure, and nutrients which will address the low CEC and nutrient deficits. However, effluent also contains dissolved mineral salts that include both potentially harmful salts as well as plant nutrients. In particular, sodium salts are of concern as an excess of sodium relative to calcium and magnesium can impede plant growth, and adversely affect soil structure by increasing dispersion and erodibility while reducing permeability. If these accumulated in the soil to excessive levels, they could eventually induce salinity or topsoil sodicity. The topsoil at the site is generally non-sodic (one test hole showed moderate sodicity) and non-saline. However, the subsoil was generally strongly sodic but non-saline.

Because of the low salt addition, it is expected that surplus salts can be leached through the soil profile. It is worth noting that salinity is rarely induced on piggery effluent reuse areas when nutrients applied at sustainable rates. Because the salt addition rate is low, no impacts to groundwater quality are expected to result from this leaching. Nor is it expected that subsoil sodicity will increase significantly. Nevertheless, both salinity and sodicity will need to be monitored and corrective action taken as needed.

The other potential impact of salt on reuse areas is reduced crop yields, which in turn affects nutrient removal rates. To avoid impacts to crop yields, effluent will be diluted as necessary for crops with less salt tolerance. Effluent could also be irrigated onto land planted to less tolerant crops such as lupins just before planting rather than during the growing season. Other areas could be planted with more tolerant crops that could be irrigated during the growing season.

The addition of sludge to land will add valuable phosphorus and a range of other nutrients. It will add some salt but this is not expected to be at levels that will create an issue.

Compost additions will enhance soil quality by adding significant organic matter and nutrients that will be used by crops. Because very little water is used in deep litter housing, the salt load will be relatively low. No negative effects are expected.

5.5.3. E.5.c Mitigation, Management and Monitoring

The organic matter and nutrients added to soil by effluent and compost spreading will improve soil structure and enhance the nutrient status. Nutrients will be applied at rates that are matched by removal rates through crop harvest. Annual soil monitoring of topsoil and subsoil will detect any issues with nutrient imbalances or excesses and subsoil sodicity. Nutrient surpluses will be addressed by adjusting future reuse rates or crops. Nutrient imbalances will be corrected through fertiliser or amendment additions.

While soil salinity and sodicity issues are not expected to arise, these will be regularly monitored.

If salinity or sodicity start to become an issue, KBM Farms will take corrective action. This could include the use of a reverse osmosis plant to improve the quality of the bore water used in the piggery, which will also reduce the salinity of the effluent. The addition of a calcium amendment at depth will promote sodium movement through the subsoil. An increase in the size of the effluent reuse area, to spread the effluent more thinly, could also be considered although a generously sized area has already been provided.

5.6. E.6 DRAINAGE AND STORM WATER MANAGEMENT

5.6.1. E.6.a Baseline Conditions

There are no waterways through the piggery complex area, with stormwater draining towards the intermittent Mittagong Creek to the north and north-west of the subject property and to Mundawaddy Creek to the north-east of the subject property. Mittagong Creek does pass through the reuse areas of the Munyabla farm. There are also intermittent waterways through the reuse areas of the Urana and Yerong Creek farms.

5.6.2. E.6.b Impact Analysis

Stormwater captured within a piggery complex can be contaminated with manure and sediment. However, in this case, stormwater runoff from the piggery will be completely controlled. A Stormwater Management Plan will be developed to ensure sediment escape during construction and operation is minimised. Section 7.1.1 provides further detail. No impacts to water quality are expected. The only impact will be that the land contained within the piggery complex will no longer drain to the creeks. Given the small area of land involved, this is considered an insignificant impact.

5.6.3. E.6.c Mitigation, Management and Monitoring

The piggery has been designed to prevent effluent, manure and potentially contaminated stormwater from leaving the site. The deep litter shelters will not produce liquid effluent and they will have raised bases so no stormwater runoff can enter these. Nor will stormwater runoff be able to enter the conventional sheds. Roof runoff from these will be collected in dams for use as piggery cleaning water. All effluent produced within the conventional sheds will be completely controlled; none will be inadvertently released. The effluent will pass through the fully contained solids separation system and then into the effluent treatment ponds. The banks of these will sit above ground level to exclude the entry of stormwater runoff. These have been sized for a design spill frequency of 1 in 10 years with some additional capacity provided. When the anaerobic pond is covered at stage 3, stormwater collecting on it will also be directed to dams for reuse as shed cleaning water. Stormwater captured within the manure composting area will be controlled by bunds. The runoff will drain into the effluent treatment system holding pond, which is sized to take this effluent. Additionally, a bund will surround the entire piggery complex. Runoff caught within the bunded area will drain to the northern end where it will be absorbed by the tree and shrub landscaping buffer. This will ensure the quality of extraneous stormwater is very well protected.

Banks and bunds around the piggery, and the volume of water in the effluent holding pond, will be regularly monitored. These will also be checked after rainfall events.

Buffers will be provided between the reuse areas and the waterways. These will help to prevent stormwater carrying sediment or dissolved nutrients from entering waterways.

5.7. E.7 FLOODING

5.7.1. E.7.a Baseline Conditions

Birgit Ronnfeldt of Lockhart Shire Council was consulted regarding the potential for the piggery site to flood (pers. comm. 1st February 2019). She advised that the site was not subject to flooding.

Based on the local knowledge of the proponents, the proposed reuse areas on the Munyabla and Yerong Creek farms are also not flood-prone.

The Urana farm is flood prone, however the owners believe that the flood frequency is less than once every five years.

5.7.2. E.7.b Impact Analysis

Since the piggery site, the Munyabla farm and the Yerong Creek farm are not subject to flooding, there is no risk of impacts at these sites.

The Urana farm is subject to flooding but there will be no piggery structures on this site; it is only for reuse. This farm is currently used to grow crops and receives annual fertiliser inputs. As a reuse area, part of those inputs would come from compost. Application rates will be controlled to ensure nutrient levels remain sustainable. As the compost will be pasteurised, there is minimal risk of it containing pathogens or weed seeds. Hence, the proposed purpose poses no greater risk than the status quo. The National Environmental Guidelines for Indoor Piggeries (Tucker, National Environmental Guidelines for Indoor Piggeries, 2018) specify a maximum flood frequency of one in five years. The owners are confident that the site floods less frequently than this.

5.7.3. E.7.c Mitigation, Management and Monitoring

There is no need for mitigation, management or monitoring at the piggery complex site, Munyabla farm or Yerong Creek farm as these are not affected by flooding. Nor is flooding likely on the proposed reuse areas.

Mitigation measures, in the form of banks, are already in place on the Urana farm. Records of flood events on the farm will also be kept including details of the dates land is submerged and the flood frequency.

5.8. E.8 TRAFFIC AND ROAD IMPACTS

5.8.1. E.8.a Baseline Conditions

The property entry point will be off Dick Knobels Road with local access via Dick Knobels Road and Semlers Lane. Dick Knobels Road is an unsealed, near-flat, white gravel road in good condition. Semlers Lane is a gravel road in reasonable condition. Both these roads are used to transport grain during harvest.

5.8.2. E.8.b Impact Analysis

Staff cars and semi-trailers will provide transport for piggery operations. Vehicles will access the site via either Dick Knobels Road or Semlers Lane. While most grain and straw trucks will be local, sale pigs will also use the Henty-Pleasant Hills Road, Alma Park Road, Walbundrie-Alma Park Road, Kywong-Howlong Road before entering the Riverina Highway in Howlong.

On average, there will be about:

- 5 truck movements in and 5 truck movements out each week at stage 1
- 8 truck movements in and 8 truck movements out each week at stage 2
- 11-12 truck movements in and 5 truck movements out each week at stage 3.

Peak traffic volumes are likely to occur in the first few months of each year when compost will be transported from the site for spreading. If this occurs evenly in February, March and April peak truck movements in these months will average:

- Stage 1: 8.7 trucks per week (5.1 compost trucks, 3.6 other trucks)
- Stage 2: 13.8 trucks per week (7.6 compost trucks, 6.2 other trucks)
- Stage 3 19.2 trucks per week (10.2 compost trucks, 9.0 other trucks)

Even at peak times, there will be only 2-3 truck movements in and out per day.

Although the total number of truck movements is small, it would represent a significant increase in truck movements along both Dick Knobels Road and Semlers Lane.

5.8.3. E.8.c Mitigation, Management and Monitoring

Given that the use of semi-trailers is permissible on Dick Knobels Road and Semlers Lane, no upgrades are proposed. However, the property entry point off Dick Knobels Road will be upgraded generally in accordance with the engineering standards for commercial and industrial development in accordance with the Lockhart Shire DCP. To that end:

- the driveway will be constructed to a standard and width suitable for semi-trailer access.
- the driveway will be suitably drained.
- the driveway will ensure all vehicles enter and leave the site in a forward direction.
- An internal driveway width of 6 m will be provided.

All trucks coming to the piggery site will drive at speeds that are suitable for road conditions. Drivers will be expected to consider other users on the road and slow down or stop for stock on roads. No significant impacts to road safety are expected.

5.9. E.9 NOISE

5.9.1. E.9.a Baseline Conditions

The subject property, and the farms providing for reuse, are situated within a farming area. Noise is currently generated from tractors planting and harvesting crops, trucks transporting inputs and produce and occasional livestock noise.

5.9.2. E.9.b Impact Analysis

Noise from industry can directly impact nearby residents (noise-induced hearing loss, speech interference, sleep disturbance and annoyance) and can cause long term effects on physical and mental health due to long-term annoyance and prolonged sleep disturbance. The NSW Industrial Air Policy (Environment Protection Authority, 2000) sets out recommended noise levels from industrial noise sources to houses in rural areas. These are shown in Table 48.

Table 48 – Recommended Noise Levels from Industrial Noise Sources for Residences in Rural Areas

Time of Day	Acceptable Level	Recommended Maximum
Day	50	55
Evening	45	50
Night	40	45

From the NSW Road Noise Policy (Department of Environment, Climate Change and Water, 2011), the assessment criteria for existing residences affected by additional traffic on existing local roads generated by land use developments are:

- $L_{Aeq,(1\text{ hour})}$ 55 (external) in the day
- $L_{Aeq,(1\text{ hour})}$ 50 (external) at night

To assist with interpreting these limits, Figure 69 is provided. This figure shows common sounds and their typical noise level. It is reproduced from the NSW Road Noise Policy (Department of Environment, Climate Change and Water, 2011).

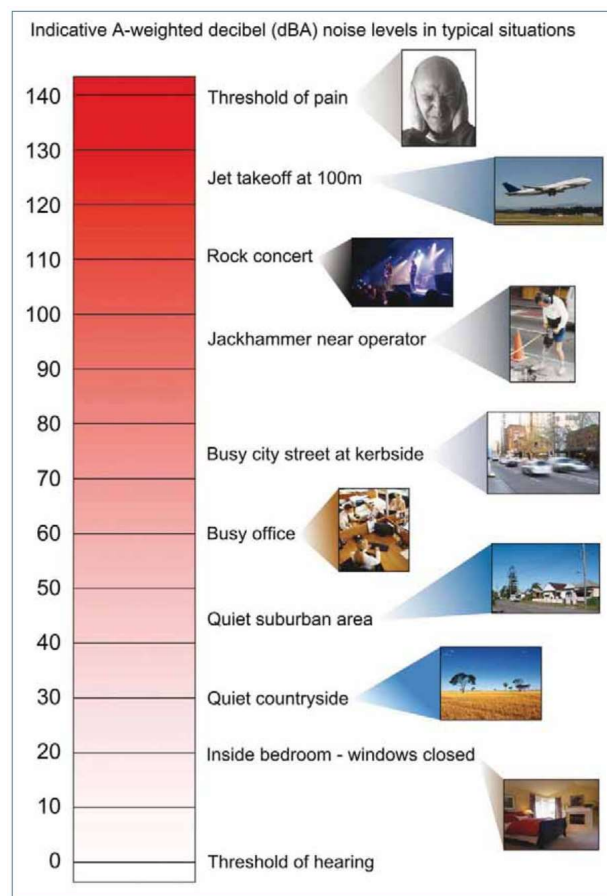


Figure 69 – Common Sounds and their Typical Noise Level

The machinery used within the piggery complex will generate some noise. This includes noise from feed milling, stock feeding and pumping of water and effluent. Because the pigs will be fed automatically, noise will not be triggered by feeding. However, some short-term squealing could be expected when pigs are moved between housing or loaded for sale. These activities are generally undertaken either intermittently or at regular intervals of short duration, generally less than one hour. In most cases they will occur during the day. The exception is that pig loading will occasionally need to occur early in the morning in exceptionally hot weather for welfare reasons. The noise from these sources will not exceed the acceptable levels at the boundary of the property. It is expected that this noise will be inaudible at the nearest houses.

At stage 3, the pond will be covered and a generator installed at the site. While this will operate constantly, it will create little noise (~80 dB or less at a distance of 1 m from the generator). Given that noise reduces with distance, this noise will not exceed the acceptable level at the property boundary. It is expected that this noise will be inaudible at the nearest houses.

The piggery will generate some additional truck movements on Dick Knobels Road and Semlers Lane. It will not significantly increase heavy vehicle movements on other roads used. House 3 and house 4 are both reasonably close to these roads. These houses are owned by one of the owners of KBM Farms and by the mother of this owner. Nevertheless, to minimise the risk of noise nuisance, truck movements will be scheduled to occur during the day, although there will be occasional stock trucks early in the morning. Assuming trucks travel at a speed of 50 km/hr along Semlers Lane and Dick Knobels Road, and the noise affects the houses for 150 m either side of the houses, the noise impact will be for 22 seconds per vehicle going past or 44 seconds per in and out truck movement. (50 km/hr = 833 m/min. It will therefore take $300 \text{ m} / 833 \text{ m} = 0.36 \times 60 \text{ seconds} = 21.6 \text{ seconds}$).

In the NSW Road Noise Policy, noise is calculated as an average maximum one-hour noise level using 15 minute intervals. The limit is 55 dB during the day and 50 dB at night. If we assume that the truck noise level is 90 dB & the background noise level is 30 dB, the increase in noise can be estimated. Assuming that at peak times there are four truck movements in one hour, one every fifteen minutes, the noise based on 15 minute averaging will be:

$$((44 \text{ s} / (60 \text{ s} / \text{min} * 15 \text{ minutes}) * 90 \text{ dB}) + ((1 - (44 \text{ s} / (60 \text{ s} / \text{min} * 15)) * 30 \text{ dB})) = 4.4 \text{ dB} + 28.53 \text{ dB} = 33 \text{ dB}$$

This is well below the maximum limit of 55 dB required in the NSW Road Noise Policy.

The NSW Road Noise Policy (Department of Environment, Climate Change and Water, 2011) also notes that new developments must not increase noise by more than 12 dB. The additional noise from the operation of the pig farm and from associated occasional truck movements will be well below this level. Hence, noise is not likely to create nuisance.

5.9.3. E.9.c Mitigation, Management and Monitoring

The suitable separation distance to neighbours mean that noise from the piggery complex is expected to be inaudible at the closest houses, and create no more impact than other farming operations in the area. Truck movements will be scheduled to occur during the day whenever practical to minimise the likelihood of night-time impacts.

All trucks, tractors, pumps and generators used at the piggery will be fitted with mufflers. The effectiveness of these will be monitored by management and replacement undertaken if required.

Noise generated by reuse area activities will be no different from the current position.

5.10. E.10 DUST

5.10.1. E.10.a Baseline Conditions

Under baseline conditions, dust is generated by farming activities, wind movement across bare paddocks and by vehicle movements along unsealed roads.

5.10.2. E.10.b Impact Analysis

The piggery complex is unlikely to generate significant dust. Some dust will be released when feed is milled, unloaded or distributed. Milling won't create a large amount of dust. Dust extractors will be fitted to the equipment and most residual dust this will settle within a few metres of the milling area. Prepared feed will be stored in sealed silos which will prevent dust releases. Most of the feed will be pellets or liquid feed, neither of which will release significant dust during feed distribution. As the pigs will be kept in sheds or shelters, they won't generate dust. Moisture from manure will minimise dust release from the bedding within the deep litter shelters. The moisture content of the composting spent bedding and separated solids will be managed by adding treated effluent as needed to optimise the process. Handling of dry compost will be avoided.

Truck movements along Dick Knobels Road and Semlers Lane will generate some short-term additional dust that could impact house 3 and house 4 which are both reasonably close to these roads. These houses are owned by one of the owners of KBM and his mother.

At times, the spreading of compost could increase dust levels if dry material is spread, particularly under windy conditions. As the compost will be watered during the composting process, the fresh product will be moist. Under prolonged storage some drying will occur although it is expected that most material will have a reasonable moisture content. Since a large area of land will be used for compost spreading, there is a risk of nuisance if this activity is poorly managed.

5.10.3. E.10.c Mitigation, Management and Monitoring

Dust from the piggery complex is most unlikely to reach the neighbours' houses due to the separation distances available. However, some dust will be produced by truck movements along Dick Knobels Road and Semlers Lane during dry weather.

The number of truck movements will generally be very small, averaging less than two movements in and out per day for most of the year and up to three movements per day during peak periods. The two houses closest to the roads, and therefore most likely to be affected, belong to one of the owners of KBM Farms and his mother, making the situation manageable. If required, drivers will be asked to reduce the speed past the houses to 40 km per hours to minimise dust nuisance. If there were a significant issue, the roads could be watered as is current practice during the harvest period.

Dust from compost spreading can be managed by avoiding spreading dry material and by considering weather conditions and location options when planning spreading events. If the compost is particularly dry, it can be wetted (with water, not treated effluent) and mixed before

spreading if necessary. This could be required if it will be spread close to houses or main roads. Alternatively, it could be spread on paddocks that are well separate from people. Spreading of compost, particularly dry material, will be avoided early in the morning, later in the afternoon or under heavy, overcast conditions when dispersion will be limited. All compost spreading will be avoided under windy conditions.

5.11. E.11. VISUAL IMPACTS

5.11.1. E.11.a Baseline Conditions

The land surrounding the piggery is mostly cleared for farming, with some scattered paddock trees remaining. There is also some roadside vegetation along Dick Knobels Road and Robertsons Lane. No clearing of any trees is proposed. Some of the houses close to the site are at a slightly higher elevation than the site.

5.11.2. E.11.b Impact Analysis

At each stage of development, new conventional sheds (see Photograph 1 for an example) and deep litter shelters (see Photograph 2 for an example) will be added. The conventional sheds will be long narrow sheds. The deep litter shelters will be long, narrow hooped structures similar to the plastic greenhouses used in horticulture. In both cases, the pig housing will be light in colour to reflect heat. Right from the start, effluent ponds with banks above ground level, and a composting pad will be installed.

In some cases, the piggery site could currently be visible from some houses since it is at a lower elevation than most of the nearby houses. However, trees around the houses would interrupt any clear view of the piggery site.

It is proposed that tree lines will be planted on all sides of the piggery complex to soften visual impacts. At least three rows of trees will be planted and shrubs of varying heights will be planted amongst the trees to provide an effective visual screen. Indigenous trees and shrubs will be selected for the landscaping.

5.11.3. E.11.c Mitigation, Management and Monitoring

The planting of a tree and shrub barrier around the piggery will effectively mitigate visual amenity impacts. The planting of these trees at Stage 1 will mean that the trees are well established before the piggery is fully developed. KBM Farms will consult with the Lockhart Shire Council to select suitable species, planting density and other management. An irrigation system will be installed to ensure the plants establish. Any dead or diseased plants will be promptly removed and replaced.

5.12. E.12. PEST AND INSECT CONTROL

5.12.1. E.12.a Baseline Conditions

Like other farms in the area, there are occasional foxes, wild dogs and feral cats at the farm. At times, mice and locust plagues are experienced. Introduced bird species are also observed. Weeds are effectively controlled as a routine part of farm management.

5.12.2. E.12.b Impact Analysis

It is not expected that the proposed piggery will have any significant impact on pests and insects. A perimeter fence will prevent foxes and wild dogs from entering the piggery complex. Hence, the piggery will have no impacts on numbers of these pests. While feral cats could access the site, these can be managed. Birds, rodents and insects will be attracted to grain. A clean and tidy site will provide less habitats and feed sources and will be the key to managing pest numbers. If this is supported by strategic control of pests, significant off-site impacts are unlikely.

5.12.3. E.12.c Mitigation, Management and Monitoring

Good management practices such as site cleanliness, hygiene, rat baiting and fly baiting will effectively control insect and rodent pests. Grass will be planted around the sheds, ponds and composting area and this will be kept slashed to minimise habitats. All feed storage silos, feed bins and feed lines will either be enclosed or designed to prevent access by rodents and birds. Feed spills will be cleaned as soon as practicable. The conventional sheds will be built from easily-cleaned materials and will be regularly pressure-washed to remove manure and feed residues from the flooring.

A strategic rodent baiting program will be used to control rodents and insects. This is likely to include rat bait stations external to the pig housing with regular inspection and bait top-up if required. Insect bait stations will also be used if required.

5.13. E.13. FLORA AND FAUNA

5.13.1. E.13.a Baseline Conditions

The farm on which the piggery is sited has been cleared and farmed for many years. It is not covered by biodiversity mapping although some scattered paddock trees are present. There are some areas close to some of the reuse areas with vulnerable remnant vegetation including western slopes grasslands and floodplain transitional woodlots near the Munyabla farm. All of the land identified for reuse is fully cleared for the cropping that has been undertaken for many years. However, there will be some nearby remnant vegetation formations close to some reuse areas.

5.13.2. E.13.b Impact Analysis

The piggery complex is not expected to have any negative impacts to native vegetation. It is not intended that the proposed piggery will require the removal of any trees. It is also proposed to plant an indigenous tree and shrub buffer around the piggery complex. This will provide vegetation that is in harmony with the remnant tree and shrub species.

Reuse of effluent and manure adds nutrients to the soil which is generally beneficial for plants if managed well. However, elevated nutrients and spray drift of effluent can adversely affect native vegetation.

5.13.3. E.13.c Mitigation, Management and Monitoring

To protect remnant vegetation, a 250 m buffer will be provided between the effluent reuse areas and any native vegetation mapped on Figure 61 and Figure 62, with a 25 m buffer provided between sludge and compost reuse areas and vulnerable native vegetation.

5.14. E.14. HERITAGE

5.14.1. E.14.a Baseline Conditions

Although the Lockhart LEP and the AHIMS system have not recorded any Aboriginal heritage items on or near the proposed pig farm, further investigation by Mark Saddler of Bundiyi Aboriginal Cultural Knowledge identified that the locality was culturally sensitive, with Yerong and Kengal (The Rock) having been inhabited by his Wiradjuri people for over 60,000 years. Mr Saddler noted that existing and old creek lines are also extremely important to the area and to the Wiradjuri people. Furthermore, Munyabla and the surrounding area include many Wiradjuri scar trees, sources of bush tucker and wildlife refuges for native animals.

The applicants are not aware of any items of European heritage significance on the pig farm or any of the reuse areas.

5.14.2. E.14.b Impact Analysis

The construction of the piggery, particularly excavation for shed bases, and the effluent ponds, pose a risk of damaging Aboriginal artefacts if these are present. There is also a risk of effluent and manure reuse affect native vegetation and wildlife, and Wiradjuri special places and items if these are not carefully managed.

5.14.3. E.14.c Mitigation, Management and Monitoring

To minimise the risk of damage to artefacts, the piggery complex will be sited away from old and current waterways. Additionally, KBM Farms will commit to the Piggery Manager undertaking cultural awareness training and education provided by local Elders or Wiradjuri community members. The contractors involved in excavations for the site will also be expected to undertake this training. This is to help with the identification of Aboriginal items during construction, and to ensure all Aboriginal sites and items will be treated with respect, with any work considering the potential for impacts. In the event that an Aboriginal object is found during construction, work will immediately stop and the Office of Environment and Heritage will be notified as soon as practical. If human remains are found, work will stop, the site will be secured and the NSW Police and the Office of Environment and Heritage will be notified as soon as practical.

If any Aboriginal items are recorded in the future on land used for the piggery or its reuse areas, these will remain at the property and will only be moved in the presence of an Elder or Wiradjuri community member. Where items cannot be moved (e.g. scar trees, if any), suitable buffers will be placed around them.

5.15. E.15. HAZARDOUS CHEMICALS

5.15.1. E.15.a Baseline Condition

Currently no chemicals are stored on-site at the subject property.

5.15.2. E.15.b Impact Analysis

Chemical usage will be minimal, so relatively small quantities of chemicals will be kept on-farm at any time. This will include veterinary chemicals, disinfectants for shed cleaning, rodent and fly baits, small quantities of herbicides and small amounts of fuel for pumps. All chemicals will be suitably stored in lockable areas. A material safety data sheet (MSDS) for each hazardous chemical will be

prominently located near the chemical. The spill containment equipment specified on the MSDS will be kept in or near the chemical storages. The likelihood of a chemical contamination incident is very low.

5.15.3. E.15.c Mitigation, Management and Monitoring

All chemicals will be stored and used in accordance with the packaging directions or veterinary advice. A MSDS for each hazardous chemical will be prominently located near the chemical. Spill containment equipment will be kept in or near the chemical storages. Details of all chemical purchases, usage and disposal will be recorded.

5.16. E.16. ANIMAL WELFARE

5.16.1. E.16.a Baseline Conditions

The applicable animal welfare standards are the:

- Model Code of Practice for the Welfare of Animal – Pigs (Primary Industries Standing Committee, 2008),
- Australian Animal Welfare Standards and Guidelines —Land Transport of Livestock (Animal Health Australia, 2012)
- Animal Welfare Code of Practice – Commercial Pig Production (NSW Government Industry & Investment, 2009).

Note: Animal Welfare Code of Practice – Commercial Pig Production is prescribed under the Prevention of Cruelty to Animals (General) Regulation 2006 (NSW Government, 2006).

5.16.2. E.16.b Impact Analysis

It is in the proponent's interests to optimise animal welfare. This means that all facilities and management need to meet or exceed the standards. Pig housing comply with all the design requirements of the various codes. In particular, the space requirements the space requirements of Appendix 3 of the Model Code of Practice for the Welfare of Animal – Pigs and Schedule 1 of the Animal Welfare Code of Practice – Commercial Pig Production will be met. Dry sows, weaners, porkers, growers and finishers will be group-housed. Farrowing sows will be kept in farrowing crates to prevent the sows from lying on and squashing their piglets.

Persons responsible for the care of the pigs will be skilled in piggery work and competent to ensure the health and welfare of the animals, or will be under the direct supervision of skilled personnel. Personnel will be appropriately instructed on how their actions may impact a pig's welfare. Staff will undergo formal or on-the-job training under the supervision of experienced staff within the first six months of their employment, with ongoing training provided. All pigs will be inspected at least daily by a competent stockperson and managed to optimise health. Sick pigs will be treated in accordance with veterinarian advice.

Strict quarantine rules will apply. Visitors will be restricted, with management considering time since last visit to a pig farm or abattoir (3 days minimum) and recent overseas travels before permitting site access. The date, time, name, contact details and purpose of visit will be recorded for all site visitors. Visitors will also be required to change into farm overalls and boots before entering the site.

All pigs will have constant access to water. The salinity of the bore water on-site is suitable for pig consumption. Water will be checked daily. Back-up water will be stored in tanks and can be provided as required.

Every day, all pigs will be provided with feed designed to meet their nutritional and production needs.

Pigs will always be transported in accordance with the Animal Welfare (Land Transport of Livestock) Code of Practice.

5.16.3. E.16.c Mitigation, Management and Monitoring

It is intended that the new pig farm will be accredited under the APIQ✓[®] industry quality assurance program, which includes a module on animal welfare. Records demonstrating compliance will be maintained continuously.

5.17. E.17. ECONOMIC AND SOCIAL EFFECTS

5.17.1. E.17.a Baseline Conditions

In a submission to the Productivity Commission, the Pork Council of Australia (2004) identified that the income multiplier for pork was the highest of all industries in the Australian economy (with \$1 in wages and salaries in pork production generating \$6.57 in income in the rest of the economy). The study also found the employment multiplier was second only to poultry amongst agricultural industries, generating almost one extra job in the economy for each job in the industry.

5.17.2. E.17.b Impact Analysis

Significant work will be involved in constructing the pig sheds, composting pad and effluent treatment ponds. Local builders will be given preference for undertaking this work.

On completion the proposed pig farm will employ eight full time staff. Most of these positions will be working directly with pigs, others will be in maintenance, management and administration.

Assuming salaries total \$500,000 per year at stage 3, the income for the rest of the economy (using 2004 figures) will be \$3.285 M per year. This will significantly help the local economy. In particular, local farmers will benefit from the opportunity to sell grain and straw locally. Local transport companies will benefit from the opportunity to take up regular livestock transportation work.

5.17.3. E.17.c Mitigation, Management and Monitoring

The proposed development will only produce positive economic and social impacts. The positive impact on the Lockhart Shire should be very significant.

6. F LIST OF APPROVALS AND LICENCES

The piggery will require the following approvals and licences:

- Lockhart Shire Council Development Consent for the piggery, septic tank and soakage trench and pipe under road to effluent reuse area.
Constructions certificates will also be needed.
- NSW EPA License and approval to operate a piggery under Protection of the Environment Operations Act 1997
- NSW Office of Water Bore licences

7. G COMPILATION OF MITIGATION MEASURES

7.1. G.a Environmental Management Outline

7.1.1. G.a.i Management of Construction Impacts

Most of the potential impacts during construction will pertain to earthworks. Earthworks will be needed to construct:

- piggery roads
- bunding around the piggery complex
- building pads
- effluent settling tank / screw press base
- anaerobic pond and holding pond
- manure composting pad

It is proposed that a Soil and Water Management Plan (SWMP) will be prepared and implemented for the construction phase and that a Stormwater Management Scheme will be implemented for the operational phase. The SWMP will be prepared in accordance with the requirements outlined in Managing Urban Stormwater: Soils and Construction (Landcom, 2004).

The purpose of this SWMP is to detail the measures that will be implemented to mitigate potential soil erosion and resulting water quality impacts on land and water resources within and beyond the areas disturbed during the construction of the facility and during the operational phase. The SWMP will:

- describe the measures that will be employed to minimise soil erosion and the discharge of sediment and other pollutants to lands and / or waters during construction activities.
- describe the measures that will be employed to mitigate the impacts of stormwater runoff from and within the premises following the completion of construction activities.
- maximise the diversion of run-on water from lands up-slope and around the site.
- maximise the diversion of stormwater runoff containing suspended solids to sediment removal structures installed on the premises.
- ensure the drainage from all areas that will mobilise suspended solids and organic contaminants when stormwater runs over these areas is controlled and diverted through appropriate solids removal facilities.
- minimise the area of the site that generates suspended material or contaminated stormwater when water runs over it.
- maximise the reuse of captured stormwater at the premises.
- ensure the effluent treatment system from the piggery has sufficient capacity to contain all effluent generated at the premises to ensure there are no uncontrolled discharges to the environment.
- ensure the liner for the effluent treatment system consists of either re-compacted clay or similar material at least 450 mm thick with an in-situ co-efficient of permeability of less than 10^{-9} m/s or an alternative liner system producing equivalent or better performance.

Its objectives will be to:

- specify relevant erosion and sediment controls to be implemented to control soil erosion and water management on-site
- document maintenance measures for soil erosion and water management controls
- establish an inspection framework to ensure proactive management of erosion and sedimentation impacts
- outline reporting and reviewing requirements
- detail responsibilities pertaining to erosion and sedimentation management.

Good control of stormwater will be critical for minimising soil erosion and the quality of water leaving the property during construction.

Soil erosion and stormwater contamination with sediment are the main construction risks for the proposed development. The land on-farm has sodic subsoils, which effects soil structure and erodibility. Particular care will be needed during construction to minimise erosion and soil loss. This will involve controlling stormwater runoff and limiting vegetation removal and ground disturbance to the minimum practical area at any time. The site will be continually visually monitored for signs of erosion and excessive soil loss with prompt corrective action taken as needed.

Construction of the access road will occur first to provide site access. Road construction will occur in stages to minimise site disturbance, with each section stabilised as quickly as practical. Road construction dust will be minimised by applying water as needed. The road will be cambered with water draining to a shallow drain on either side of the road.

Construction of the perimeter bank around the piggery complex will occur in conjunction with the road work. The bank will allow rainfall runoff to be diverted around the site, minimising the area of the site able to generate suspended material or contaminated stormwater as a result of water running over it. Runoff generated will be absorbed and used by the vegetated tree buffers planted below the piggery.

Next, the piggery complex site will be land-formed in readiness for further construction. The most significant earthworks will be for the construction of the effluent ponds which will be partly excavated into the ground. The effluent sump will need to be excavated. The screw press base will require earthworks and concreting. The conventional sheds will have below-floor effluent pits that will need to be excavated. The deep litter shelters will need to have pads formed up, upon which concreted footings will sit. While the finished surface of the manure composting area will sit at or near natural surface level, it will include a 600 mm deep compacted base that will require significant earthworks and the whole area will be surrounded by a bank.

In all cases, topsoil removal will occur just prior to bulk earthworks. Soil piles will be stored within the piggery complex area for later use. Where practical, topsoil will be handled when moist to prevent structural decline. As soon as practical after disturbance, the soil will be stabilised to minimise sediment removal in the event of rain. Wastes will also be stored in on-site waste receptacles or piles within this area.

Since robust groundcover effectively prevents soil erosion, the land surrounding the buildings and piggery facilities will be spread with topsoil and planted to lawn as soon as practical after construction is completed. These areas will be watered to ensure the grass establishes.

The earthworks contractor will be responsible for establishing, inspecting and maintaining all sediment and erosion control measures during construction. This will occur on a daily basis whenever the contractor is working on the site. It is expected that any issues will be promptly addressed.

Should any item of heritage or archaeological significance be unearthed during construction, further disturbance will immediately cease. The item/s will be assessed by relevant heritage authorities and any necessary preservation measures enacted.

No trees will need to be removed during construction. Additional indigenous trees and shrubs will also be planted as a visual screen. Hence, any impacts to native vegetation will be beneficial.

The piggery site will be fenced with a wire mesh and barbed wire fence. Vehicles will need to go through entrance gates. Signage at the entry to the site will alert people of the biosecurity requirements and provide a phone number for them to call should they wish to enter the farm.

To minimise the risk of light and noise nuisance from construction, this will occur between 7 AM and 6 PM.

7.1.2. G.a.ii Management of Operational Impacts

Operational impacts could include impacts to:

- amenity
- surface waters
- groundwater
- flora and fauna
- Aboriginal cultural heritage
- soils

Amenity

Piggeries have the potential to impact on comfortable enjoyment or life or property in many ways, including nuisance from odour, dust, noise and light spill; changes to visual amenity; impacts from increased traffic; increased vermin and insects; inappropriate waste management and health impacts. The piggery is suitably sited, which is important in preventing most amenity impacts. With good management, the residual risks can be effectively managed.

The separation distances between the piggery complex and nearby houses are sufficient to protect air quality from odour, dust, with good design and management. These include:

- slatted flooring over pull plug effluent pits in the conventional sheds, with frequent and regular pressure-washing of sheds and release of effluent to keep the sheds clean and odour down.
- concrete bases on the deep litter housing, with enough straw provided to absorb manure and provide a dry place for pigs to rest.
- an anaerobic pond that is adequately sized to treat the expected effluent stream.

- installing an impervious cover over the anaerobic treatment pond at stage 3. The biogas collected under this cover will be used to generate electricity and heat for the piggery. This will significantly reduce the overall odour and greenhouse gas emissions from the piggery.
- a well-drained compacted base on the composting area that will be resistant to pothole formation that can concentrate odorous runoff water.
- an intensively managed composting process for spent bedding and separated manure solids that will ensure the material remains moist but aerobic. The process will involve regular turning and wetting with treated effluent. Composting represents best practice as it is a low odour, aerobic process that stabilises the manure, producing a slow release nutrient source for crops. Handling and turning of dry finished compost will be minimised; if necessary, this material can be wet-up with water before spreading.
- a suitable process for composting mortalities. At all times during active composting the bodies will be kept well covered with a high carbon material. Composting mortalities on a sealed and bunded pad and using a suitable process represents best practice as odour is controlled and risks to surface water and groundwater are eliminated.
- prompt clean-up and disposal of spilt feed.
- Installation of a weather station near the piggery complex to measure weather parameters including wind strength and direction (at stage 3).
- reuse of effluent and manure only under suitable weather conditions. This will be avoided early in the morning and in the evening, if the wind is drifting towards a close neighbour, under gusty conditions, if rain is forecast within the next 24 hours or if the soil is too wet to absorb the application.

While some noise will be generated by the piggery itself, associated traffic movements and machinery used to spread sludge and compost, it is not expected that this will cause nuisance. To minimise risks:

- piggery activities, including truck movements and reuse activities will be scheduled to occur during the day whenever possible.
- Feed will be automatically distributed to the pigs which will eliminate the pig squealing that can result from hand feeding.
- machinery, pumps and vehicles associated with the piggery will be regularly serviced.
- effective mufflers will be fitted to pumps, machinery and vehicles used by the piggery.

Although the piggery site is well separated from nearby houses, it may be visible from some homes. To soften the visual impacts:

- a screen consisting of several rows of indigenous trees and shrubs will be planted around the perimeter of the complex. Lockhart Shire Council will be consulted regarding the species to grow and plant spacings.
- the planted screen will be carefully managed to ensure it establishes, with the plants watered and any sick or damaged plants promptly replaced.

The roads providing primary site access, Dick Knobels Road and Semlers Lane, are both gravel roads. Increased traffic on unsealed roads can result in increased noise and dust, more road wear and tear, and reduced road safety. To minimise these potential impacts:

- truck drivers will be asked to drive slowly (<50 km/hr) along these roads.
- roads can be watered, if necessary, to reduce dust.

- suitable property access will be established to ensure trucks and cars can safely enter and exit the property.
- a suitable internal road and on-farm parking area will be constructed so there will be no need for vehicles to park on the side of the road.

Good hygiene will be key to controlling insect and vermin. This will include:

- good manure management (described above).
- prompt clean up and disposal of feed spills and waste feed.
- mowing of lawns around the piggery complex to remove potential habitats.
- strategic use of baits to control flies, rats and mice.

The piggery will generate very little waste and this will be managed carefully with no on-farm disposal. However:

- where practical, wastes will be recycled (e.g. office paper, plastic containers).
- other waste will be collected in skips and dispatched to off-farm waste facilities.
- sharps disposal will be through a suitable facility.

It is not expected that the piggery will have any adverse human health impacts since:

- the herd will have a very high health status that will be protected through a rigorous biosecurity protocol. People will only be able to visit the piggery with permission from management and taking into account time lapsed since contact with pigs (3 days minimum) and recent overseas travels. Visitors will also be required to change into farm overalls and boots before entering the site. Staff and visitors will not be permitted to bring any pork products onto site. For every visitor, the date, time, name, contact details and purpose of visit will be recorded to allow for investigation of any incidents.

There are no nearby piggeries that will pose a biosecurity risk to the herd. No pigs will come on-site once herd established.

Only Matt Klemke's trucks will be used for stock transportation. These will be clean on arrival and won't enter the fenced piggery compound. KBM Farms will consult with their vet to finalise their biosecurity protocol. This could possibly include a truck wash near Matt Klemke's and / or a small tyre disinfection wash on the entry road.

In the event of an unexpected disease suspected at the piggery or an increase in the number of sick pigs, the KBM Farms would be immediately asked to come and investigate. The Chief Veterinary Officer and the Lockhart Shire Council would be advised of any disease outbreak. In the event of mass mortalities, the Chief Veterinary Officer, Lockhart Shire Council and the NSW EPA would be advised and consulted regarding disposal options. Where mass deaths were not the result of disease, rendering may be an option. Otherwise, composting would be preferred. It is understood that burial or incineration may be required in some circumstances.

- health risks associated with reuse of manure and effluent will be effectively managed. The composting of spent bedding, separated manure solids and mortalities will generate significant heat which will effectively destroy most pathogens. Effluent and sludge will only be applied post-pond treatment. Sludge will be spread with a tanker under low pressure and low to the ground. Effluent will be irrigated using low pressure spray within 2 m of the ground to minimise aerosol production and drift. Effluent and sludge will not be applied when the wind is carrying towards nearby houses. Effluent and manure reuse will only be spread during the day-time, avoiding times when inversion layers are likely (early morning, evening) as aerosols and dust may carry further under these conditions. Reuse will only occur under suitable weather conditions. It will be avoided under overcast conditions, when significant rain is forecast within 24 hours or if the soil is too wet to absorb the application. Effluent, sludge and compost will only be applied to land used to grow grain, oilseed and fodder crops that are not typically eaten raw by humans. They will not be applied within 2 weeks of harvest.

Surface Waters

The piggery complex has been designed to protect surface water quality. Measures include:

- very good control over the movement of manure and effluent within the piggery complex, preventing uncontrolled releases.
- bases of pig sheds designed to prevent entry of stormwater runoff
- effluent pits under conventional sheds suitably sized to contain effluent between emptying of pits
- fitting the sump with a pump that will activate effluent transfer to the screw press when the water reaches a particular level.
- outdoor drains, settling pit / sump and base beneath screw press designed to exclude the entry of stormwater runoff and to prevent the uncontrolled exit of effluent or leachate
- above-ground banks on effluent treatment ponds to prevent ingress of stormwater runoff
- effluent pond system sized to restrict spill events to less than 1 in 10 years
- monitoring of the depth of water in the effluent holding pond weekly but also if rain is forecast and after significant rainfall events to allow corrective action to be taken as needed
- bunding around composting pad to prevent ingress of stormwater runoff and uncontrolled release of stormwater caught within the area
- bunding around the entire piggery complex.

Surface water contamination can also result from poor reuse of effluent and manure compost. The required land area for reuse has been estimated based on the expected nutrient composition of the effluent and the manure compost. Management practices that will be adopted to minimise the risks of nutrients and sediment export from reuse areas in stormwater runoff include:

- applying effluent, sludge and compost evenly and at rates designed to achieve a balance between nutrients applied and nutrients removed through crop harvest
- spreading effluent, sludge and compost just before sowing or when the crop is actively growing (effluent)
- delaying reuse if the soil is saturated, or if it is raining or forecast to rain within 24 hours
- not using high-pressure spray guns
- using minimum till farming methods to avoid soil disruption
- providing suitable buffers between reuse areas and surface waters

Surface water quality can also be impacted through poor reuse practices, particularly nutrient overloading with soil. This will be prevented using the measures detailed in the section on soils below.

Groundwater

The piggery complex has been designed to protect groundwater quality. Measures include:

- very good control over the movement of manure and effluent within the piggery complex, preventing uncontrolled releases.
- impervious concrete bases beneath the deep litter shelters
- impervious concrete flooring and effluent collection pits beneath the conventional sheds
- impervious concrete drains to sump
- impervious concrete liner in effluent sump
- impervious concrete base on pad below screw press
- low permeability (1×10^{-9} m/s) liner on effluent treatment ponds and composting pad

Hence, it is very unlikely that groundwater will be impacted by activities within the piggery complex.

However, groundwater quality could also be impacted through poor reuse practices, particularly nutrient overloading that could result in leaching through the soil to unconfined aquifers. The risk of groundwater contamination will be monitored through annual testing of the subsoil of reuse areas (see section 7.2). This is considered a more pro-active measure than piezometers as it will provide for early detection and correction of an emerging issue and will cover more sites.

Groundwater will be the major clean water supply for the piggery. Based on the findings of a groundwater study included as Appendix E, a zone of drawdown influence could eventually extend ~5 km from the extraction point. It is not expected that the ongoing use of nearby bores for stock watering will be affected by the proposal. To limit groundwater use:

- clean water will be used efficiently. In many piggeries, cleaning water is a major water use. For the conventional sheds, pull plug effluent pits, which will only use top-up from shed pressure-washing have been selected over flush channels that use large volumes of water. Deep litter shelters, which require no water cleaning, have been selected where suitable. Low wastage bowl drinkers will be used for sows and bite rather than push nipple drinkers will be used for other stock to minimise water wastage.
- roof runoff will be collected and used for pressure washing the sheds, although some may also be used for diluting effluent for reuse.
- pipeline water may also be used to meet part of the water demand.

Flora and Fauna

The piggery has been sited on land that has been cleared and farmed for many decades. To prevent impacts to vegetation, and subsequent impacts to fauna:

- the piggery complex has been designed around the remaining scattered trees, and there will be no need to remove any of these.
- a screen consisting of native trees and shrubs will be planted around the piggery complex to supplement the existing vegetation.

Native vegetation, which may be intolerant of increased nutrient levels, may be adversely affected by nutrients from spray drift of effluent. To minimise the risk to remnant stands:

- effluent will not be irrigated within 250 m of remnant vegetation
- sludge and compost will not be applied within 25 m of remnant vegetation.

Aboriginal Cultural Heritage

A range of measures will be put into place to protect Aboriginal cultural heritage. They include:

- ensuring the piggery buildings, effluent ponds and composting area are suitably designed and bunding to prevent the escape of manure and effluent in the event of a spill
- constructing and managing piggery buildings to prevent ingress of stormwater and uncontrolled exit of effluent and manure
- ensuring the settling tank, ponds and manure composting area are constructed with bunds or walls that prevent ingress of stormwater and uncontrolled exist of effluent and manure.
- sizing the effluent ponds for a 1 in 10-year spill frequency
- maintaining suitable buffers to waterways, vulnerable native vegetation, known items of Aboriginal cultural heritage significance and sensitive land uses.

Soils

Once the piggery is fully constructed and lawns established over disturbed areas within the piggery complex, there should be not impacts to soils within that area.

With good management, it is expected that the soils and crops grown on reuse areas will benefit from effluent and manure additions. This will be achieved through:

- application of effluent, compost and sludge at sustainable rates. Nitrogen, phosphorus and potassium application rates will not exceed expected harvest removal (plus acceptable losses of nitrogen), although some phosphorus surpluses between years are acceptable.
- even spreading of effluent, compost and sludge
- recording the quantity of effluent, compost and sludge applied to each area and the type and yield of crops harvested.
- undertaking regular soil testing, with interpretation of results.
- adjusting cropping programs and nutrient management to respond to nutrient surpluses and imbalances.
- addressing soil salinity or sodicity concerns.
- regularly inspecting reuse areas for signs of structural decline and weed infestation, and taking remedial actions as necessary.

It is expected that some compost and possibly sludge will be sold to nearby farmers. If this occurs:

- the following details will be recorded: date, recipient details, type of material traded, amount of material traded
- the recipient will be made aware of the minimum buffers for reuse areas as per Table 18 of this EIS
- the recipient will be provided with a recent analysis for the material
- the recipient will be made aware that the Australian Pork Limited Manure and Effluent Management and Reuse Guidelines (Tucker, 2015), particularly the glovebox guide, provide practical information for sustainable reuse.

7.1.3. G.a.iii Strategies to Improve Management using Monitoring Data

Regular monitoring of potential environmental risk areas, and interpretation of monitoring data, will allow for a more rapid response that prevents impacts.

Each morning, as staff arrive from work, they will subjectively check the odour, dust and noise coming from the piggery complex both at the property boundary and at the complex itself. Where there is an issue, potential sources will be promptly investigated. This will include consideration of weather conditions. Once any particular sources have been identified, suitable corrective and preventative measures will be actioned. Details will be recorded and, if appropriate, standard operating procedures adjusted to ensure future management is improved.

Details of all complaints received about the piggery will be recorded, including the name of the complainant (where available), the nature of the complaint (e.g. odour, dust, noise), the date and time of day of the nuisance, any suspected sources and weather data at the time of the problem. The collected data will be analysed and used in investigating the issue. Details of findings, including ongoing communication with the complainant, along with corrective and preventative actions will be recorded. Standard operating procedures will be upgraded as appropriate to prevent a reoccurrence.

Numbers of rodents and insect pests will be subjectively monitored on a continual basis and used in planning strategic control. Use of baits to control rodents and insect pests will be recorded.

Details of all visitors to the piggery will be logged to assist with investigating any disease or biosecurity incidents.

Stock numbers will be monitored, with details of births, stillborns, deaths and sales recorded daily. Detection of sick animals and treatment of same will also be recorded daily. Daily recording will allow any unusually high numbers of sick or dead animals to be quickly picked up and acted upon.

Use of pharmaceuticals will be recorded for each animal or batch of piglets as part of the quality assurance program. Use of new cleaning products will also be recorded. As chemicals may affect effluent treatment micro-organisms, this information may help in investigating effluent pond issues.

Feed wastage will be monitored through visual inspection of pens and by recording and analysing feed usage data. This will allow excessive wastage, which may adversely impact effluent treatment and also the financial performance of the piggery, to be quickly detected and fixed.

Full details of the manure composting process will be recorded to ensure the process achieves pasteurisation of the product. This is important in killing pathogens and weed seeds that could be present in the manure, minimising risks associated with reuse. Each windrow will be numbered and details of effluent or water applications and turning recorded. Effluent will not be applied after the last turn. The date of compost transfer from a windrow to the stockpile will also be recorded.

Details of mortality numbers and the mortalities composting process will be recorded. This will include the date the last body is added to a particular bay, any management of the composting material (e.g. watering, turning) and the date that the material is removed from a bay. This will help to ensure mortalities compost is safe for reuse.

Details of reuse of effluent, sludge and compost activities will be recorded. This will include: date of spreading, paddock, material spread and application rate. Effluent, sludge and compost will also be analysed annually. The type of crop grown on each reuse area, and the harvested yield will be recorded. These data will be used to assess whether the nutrient balance budget was accurate. In conjunction with soil test results, it will also be used to adjust future reuse activities to optimise agronomic and environmental outcomes.

The depth of effluent in under-floor pits, sumps and ponds will be regularly checked to avoid spills. The depth of water in the effluent holding pond will be checked weekly but also if rain is forecast and after significant rainfall events to allow corrective action to be taken as needed

Banks around the effluent ponds, the composting pad and the piggery will be checked after rainfall events to ensure they are intact and structurally stable. Any required repairs will be promptly made to ensure runoff is protected.

Groundwater use will be continually monitored. This will help management to assess whether the supply is likely to be sufficient for the staged expansions as described in this EIS. It will also allow for early detection of upcoming problems with supply.

The planted vegetation belt surrounding the piggery complex will be inspected twice weekly during the first six months after planting, once a week for the next six months and thereafter at least monthly, to identify any diseased or dead plants for replacement.

7.1.4. G.a.iv Training Programs for Operational Staff

All staff members will be trained in all areas relevant to their work area.

All people involved in stock handling will have suitable training or work under the direct supervision of a trained person.

All staff members involved in reuse of effluent, compost and sludge will be provided with on-the-job training in the where these materials can be spread, the buffers that must be maintained, times of day and weather conditions that are unsuitable for spreading and the importance of spreading these materials evenly and at suitable rates. These staff members will be made aware that any spill or unusual occurrence must be reported to senior management immediately.

At least one member of management will be trained in Aboriginal cultural heritage.

7.2. G.b MONITORING OUTLINE

7.2.1. G.b.i Key Information to be Monitored

Amenity

Complaints recording will include:

- Date
- Time of complaint

- Details of complainant
- Nature of complaint
- Weather conditions at time of the complaint
- Investigations into possible causes
- Actions taken to resolve complaint
- Communications with complainant to collect further information or confirm if issue has been remedied

At Stage 3, an automatic weather station will be installed. This will continuously monitor weather data which will assist with complaints investigation and management.

Effluent

Effluent will be tested at least annually ahead of the main reuse period using the parameters recommended in the National Environmental Guidelines for Indoor Piggeries (Tucker, 2018):

Test parameter	Justification
Total nitrogen or TKN	measure of nitrogen applied for mass balance calculations
Ammonium-nitrogen	measure of nitrogen available or potentially lost as ammonia volatilisation
Nitrate-nitrogen	measure of nitrogen immediately available for plant uptake
Total phosphorus	measure of phosphorus applied for mass balance calculations
Ortho-phosphorus	measure of phosphorus available for plant uptake
Potassium	measure of potassium applied for mass balance calculations
Electrical conductivity and chloride	measure of effluent salinity
SAR	measure of effluent sodicity

TKN = total Kjeldahl nitrogen; SAR = sodium absorption ratio

Compost and Sludge

Compost and sludge will be tested annually for the parameters recommended in the National Environmental Guidelines for Indoor Piggeries (Tucker, 2018):

Test parameter	Justification
Dry matter	to calculate nutrient applied
Total nitrogen or TKN	measure of nitrogen applied for mass balance calculations
Ammonium-nitrogen	measure of nitrogen available or potentially lost as ammonia volatilisation
Nitrate-nitrogen	measure of nitrogen immediately available for plant uptake
Total phosphorus	measure of phosphorus applied for mass balance calculations
Ortho-phosphorus	measure of phosphorus available for plant uptake
Potassium	measure of potassium applied for mass balance calculations
Organic carbon	influences soil stability
Electrical conductivity and chloride	measure of solids salinity

TKN = total Kjeldahl nitrogen

The soils of any reuse areas receiving effluent, sludge or compost in a given year will be tested for the parameters recommended in the National Environmental Guidelines for Indoor Piggeries (Tucker, 2018):

Soil test parameter	Depth (down profile)	Justification
pH	0-0.1 m 0.3-0.6 m or base of root zone	influences nutrient availability
EC _{se} (can measure EC _{1.5} and convert to EC _{se})	0-0.1 m ^a 0.3-0.6 m or base of root zone ^b	measure of soil salinity
Nitrate-nitrogen	0-0.1 m 0.3-0.6 m or base of root zone	measure of nitrogen available for plant uptake, and also to detect leaching
Colwell phosphorus and phosphorus buffering index (PBI)	0-0.1 m ^c	measure of phosphorus available for plant uptake, and also to detect leaching
Potassium	0-0.1 m 0.3-0.6 m or base of root zone	measure of potassium available for plant uptake, and also to detect leaching
Sulfur	0-0.1 m	necessary nutrient for plant growth
Organic carbon	0-0.1 m	influences soil stability, and consequently, soil erosion
Exchangeable cations (calcium, sodium, potassium, magnesium) and cation exchange capacity (CEC)	0-0.1 m 0.3-0.6 m or base of root zone	Needed to calculate ESP, EKP and Ca: Mg, which have important implications for soil structure

Each time effluent, compost or sludge are spread, the following details will be recorded:

- Date
- Time spreading started and finished
- Weather conditions
- Paddock spread
- Spreading rate

Each time compost or sludge are sold or provided to other farmers, the following details will be recorded:

- Date
- Material
- Quantity
- Destination

Groundwater

Groundwater usage will be continuously monitored.

Groundwater quality will be tested annually to confirm that the water remains suitable for consumption by pigs. The testing will also pick up any changes that could indicate contamination. Parameters will include:

- total dissolved solids
- pH
- iron
- hardness
- nitrates and nitrites.

7.2.2. G.b.ii Monitoring Location, Intervals & Duration

Complaints recording will occur at the time of complaints receipt. Following a complaint, further notation will be added as complaints investigation and consultation with the complainant progresses.

Effluent will be tested at least annually ahead of the main reuse period. A composite sample will be collected from the pipeline of a pump fitted to the holding pond.

Sludge will be tested at least annually before the main reuse area. A composite sample will be taken from material extracted using a vacuum tanker pipe inserted through the sludge removal pipes.

Manure compost and mortalities compost will be tested at least annually ahead of the main reuse period. A composite sample will be collected from various points within the compost stockpile, with a separate composite sample collected from within the finished mortalities compost bay.

The soils of any areas spread with effluent, sludge or compost in a given year will be sampled and tested.

7.2.3. G.b.ii Procedures for Monitoring

All sampling will be in accordance with Appendix D of the National Environmental Guidelines for Indoor Piggeries (Tucker, 2018).

7.2.4. G.b.iv Compliance and Reporting Procedures

The results of monitoring will be reported to the NSW Environmental Protection Authority as part of the Annual Return for the piggery Environmental Protection License.

8. H JUSTIFICATION FOR THE PROPOSAL

8.1. H.a The Precautionary Principle

The precautionary principle means that if there are serious threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation (Department of Land and Water Conservation, 2000; NSW Department of Urban Affairs and Planning, 1996).

The site for the proposed piggery has been carefully selected. It is well separated from neighbours, has no close waterways, does not have shallow, vulnerable groundwater, will not require clearing of remnant vegetation and has soils that are expected to be suitable for construction of ponds and footings. Adequate suitable water can be sourced. Representatives of local Aboriginal communities have been consulted regarding the proposal, and their advice for minimising risks of cultural heritage impacts accepted. The proposal has been carefully designed to further mitigate environmental risks. The proposed staging of the piggery development will also help to ensure any significant impacts are avoided. The planned environmental monitoring will provide early warning of any emerging impacts, allowing for their management.

The soils of the reuse areas are suitable for the proposed purpose, having been used for sustainable cropping for many years. Effluent, sludge and compost will be applied at rates that result in sustainable nutrient applications consistent with good agronomic and environmental practice. Reuse will build soil carbon and microbial levels which is important for soil structure and health. It is acknowledged that piggery effluent may contain surplus sodium that could accumulate in the soil and induce salinity or topsoil sodicity. Ongoing soil testing will monitor this concern. If required, a calcium amendment could correct this imbalance. To protect soil and runoff water quality, effluent, sludge and manure will only be applied when the soil is too dry enough to absorb the application and not if significant rain is forecast. Buffers around remnant vegetation and waterways will provide additional protection of these more sensitive areas. To protect air quality, reuse will only occur at times of the day and under weather conditions that are unlikely to result in drift to nearby neighbours.

This proposal does not involve any threat of serious or irreversible environmental damage.

8.2. H.b Inter-generational Equity

Inter-generational equity means that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations (Department of Land and Water Conservation, 2000; NSW Department of Urban Affairs and Planning, 1996).

The piggery site was carefully selected, with effective separation distances to the closest houses and no particularly vulnerable natural resources. However, the development of the site for the proposed use will require significant modification of the land within the bounds of the complex piggery. No trees will be removed and suitable measures are proposed to guard against soil erosion and surface water contamination during construction. The proposed design incorporates a raft of measures to protect amenity, surface waters, groundwater, biodiversity and soils during the operation of the piggery. It will be possible to fully remediate the site at the end of the development's life.

The addition of effluent, compost and sludge to the soils of the reuse areas is expected to build nutrients, add carbon and bolster soil microbial levels, thereby enhancing soil properties. Sodium accumulation in effluent reuse areas could induce salinity or topsoil sodicity although this can be monitored through regular soil testing and mitigated using calcium amendments.

It is not expected that the construction and operation of the piggery will have any significant adverse impacts to community amenity, surface waters groundwater, native vegetation or soils. Given that the proposal involves a small footprint for the piggery complex, and that the site can be remediated, the health, diversity and productivity of the environment will be maintained or enhanced for the benefit of future generations

8.3. H.c Conservation of Biological Diversity and Ecological Integrity

Conservation of biological diversity and ecological integrity should be a fundamental consideration in any development (Department of Land and Water Conservation, 2000; NSW Department of Urban Affairs and Planning, 1996).

The proposed piggery site has been cleared and cropped for many decades. While there are scattered trees on the subject property, none will need to be removed to make way for the development. Additionally, plantings of indigenous trees and shrubs will surround the piggery complex. Hence, biological diversity and ecological integrity will be enhanced.

The reuse areas have also been cleared and cropped for many years. No trees will be removed and a buffer will be maintained between reuse areas and vulnerable remnant vegetation. It is expected that the properties of the soils will be enhanced through reuse activities. There will be no significant impacts to biological diversity and ecological integrity.

8.4. H.d Improved Valuation and Pricing of Environmental Resources

Environmental factors should be included in the valuation of assets and services, such as:

- (1) polluter pays, that is, those that generate pollution and waste should bear the cost of containment, avoidance or abatement,
- (2) the users of the goods and services should pay prices based on the full life cycle costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste.

Environmental goals, having been established, should be pursued in the most cost effective way, by establishing incentive structures, including market mechanisms, which enable those best placed to maximise benefits or minimise costs to develop their own solutions and responses to environmental problems (Department of Land and Water Conservation, 2000; NSW Department of Urban Affairs and Planning, 1996).

The piggery will produce very little in the way of true “wastes” since effluent, sludge and compost will be beneficially reused in farming systems. While the proponents will bear the cost of managing these materials, monitoring for impacts and reporting on environmental outcomes, they will also reap the benefits of the nutrients and carbon that will improve the agronomic properties of their soils. Another significant “waste” is the biogas released as a consequence of anaerobic digestion of

effluent. It is proposed to cover the anaerobic effluent treatment pond at Stage 3 to allow for the collection of this biogas for conversion into heat and power for use within the piggery. Not only will this eliminate the need for most external power, it will also greatly reduce greenhouse gas emissions and odour.

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Appendix A – SEARS

To be provided as separate document.

Appendix B – McMahon Earth Sciences Environmental Assessment Report

To be provided as separate document.

Appendix C – Duty of Care Statement: Spent Bedding and Compost (sourced from APL Piggery Manure and Effluent Management and Reuse Guidelines)

Duty of Care Statement: Spent Bedding and Compost

Aged spent bedding and bedding compost from piggeries are great sources of nutrients for plant growth and carbon for building soil structure. However, like inorganic fertilisers, they need to be spread on suitable areas and applied at sustainable rates to ensure the environment is protected. Those utilising spent bedding or compost must take all reasonable and practical steps to prevent harm to the environment and to areas of cultural heritage sensitivity. Each state has its own Acts detailing duty of care provisions. These typically require:

- Sustainable use of natural resources
- Conservation of biological diversity
- Avoidance of harm to Indigenous cultural heritage.

In particular, spreading of spent bedding or compost needs to be managed to avoid:

- Land degradation (e.g. soil erosion, decline in soil structure, nutrient overloading)
- Odour and dust nuisance
- Surface water and groundwater pollution with nutrients and sediment
- Increased weeds
- Noise nuisance.

To minimise the likelihood of these potential impacts:

- Minimise the risk of spent bedding or compost spillage during transportation by not overfilling the truck and by covering the load
- Where practical, avoid transport routes with a large number of houses close to the road
- Spent bedding and compost should not be stored or spread on areas that are flood-prone. Nor should they be stored or spread on areas where they will pose a significant risk of nutrient transfer to watercourses (e.g. sloping land immediately abutting a watercourse)
- Check the weather forecast before spreading spent bedding or compost and delay spreading if heavy rain is expected or the soil is still very wet following heavy rain. Also check the wind speed and direction to ensure the prevailing wind is not blowing directly towards nearby residences
- Plan to spread spent bedding or compost from mid-morning to early-afternoon when good odour dispersion is likely. Avoid spreading from mid-afternoon to evening. Avoid spreading just before weekends or during holiday periods, particularly if close to a public area
- Determine a suitable spreading rate based on the N, P and K content of the spent bedding or compost, soil properties and the intended land use of the reuse area. The rate should be consistent with the ability of soils and plants grown on the area to sustainably use the applied nutrients, salts and carbon in the spent bedding or compost

- Calibrate the spreader to spread at the target rate
- Monitor reuse areas for weeds and control these if necessary. Although the aging and composting processes can destroy most weed seeds, some seeds may remain viable
- Avoid spreading spent bedding or compost close to sensitive neighbours at night when noise may create nuisance
- Do not allow grazing stock to access stored manure or reuse areas for at least three weeks after spreading.

A recent "typical analysis" sheet for the manure or compost should also be provided to the recipient.

Appendix D – McMahon Earth Sciences Geotechnical Investigation Report

To be provided as separate document.

Appendix E – Water Technology - Munyabla 1200 Sow Piggery – Hydrogeological Review

To be provided as separate document.

Appendix F – Summary of Consultation to Identify Parties with an Interest in Aboriginal Cultural Heritage

Following is a summary of the communications used to identify all interested parties to be included in the Aboriginal cultural heritage consultation process:

- 26th April 2018 – phone discussion with Simon Stirrat of Office of Environment and Heritage who recommended talking to Lockhart Shire re local Aboriginal groups and Aboriginal cultural heritage.
- 30th April 2018 – phone discussion with Alan Gundrill of Lockhart Shire Council who advised that the site was borderline between Albury and Wagga. He suggested inviting the Wagga Wagga Local Aboriginal Land Council to visit the site and provide advice.
- 13th June 2018 – phone discussion with Daniel Clegg of the Office of Environment and Heritage regarding contacts and processes to follow in relation to heritage matters. He advised that it was necessary to contact the Office of the Registrar, Aboriginal Land Rights Act to formally request a list of people with interest. He also advised that Wiradjuri included both Albury and Wagga. He suggested inviting the relevant group to come out and look / provide advice. He noted that the site was within quite a sensitive landscape.
- 14th June 2018 – email to the Office of the Registrar, Aboriginal Land Rights Act 1983 (NSW) requesting the names of any Aboriginal people who may have cultural knowledge relevant to determining the significance of Aboriginal objects and / or places on or in the vicinity of the subject property. Also, any relevant information held about the cultural significance of the site or land within a few kilometres of the site.
- 14th June 2018 – email to National Native Title Tribunal (NNTT) requesting the names of any native title claimants, native title holders and registered indigenous land use agreements within a 10 km radius. The names of Aboriginal people who may have cultural knowledge relevant to determining the significance of Aboriginal objects and / or places on or in the vicinity of the subject property were also requested. On 15th June 2018, NNTT responded to say that they had found nothing on: 1//D1211821 or 1//D373967.
- 15th June 2018 – email to Murrumbidgee Landcare Inc requesting the names of Aboriginal people who may have cultural knowledge relevant to determining the significance of Aboriginal objects and / or places on or in the vicinity of the subject property. Also, any relevant information held about the cultural significance of the site or land within a few kilometres of it. 15th June 2018 – email from the executive officer advising that they are not in a position to provide any useful info on this. They suggested contacting OEH in Albury or Riverina LLS Aboriginal Communities officer.

- 15th June 2018 – email to Steve Meredith of Office of Environment and Heritage requesting the names of Aboriginal people who may have cultural knowledge relevant to determining the significance of Aboriginal objects and / or places on or in the vicinity of the subject property. Also, any relevant information held about the cultural significance of the site or land within a few kilometres of it.
- 15th June 2018 – email to Lockhart Shire requesting the names of Aboriginal people who may have cultural knowledge relevant to determining the significance of Aboriginal objects and / or places on or in the vicinity of the subject property. On 18th June 2018 Mr Alan Gundrill of Lockhart Shire Council replied by email recommending that we contact the Wagga Wagga Local Aboriginal Land Council or Albury Local Aboriginal Land Council for assistance with Aboriginal cultural heritage enquiries.
- 15th June 2018 – email to Local Land Services - Riverina requesting the names of Aboriginal people who may have cultural knowledge relevant to determining the significance of Aboriginal objects and / or places on or in the vicinity of the subject property. Also, any relevant information held about the cultural significance of the site or land within a few kilometres of it.
- 15th June 2018 – email to Native Title Service Provider for Aboriginal Traditional Owners in New South Wales and the Australian Capital Territory (NTSCORP) requesting the names of Aboriginal people who may have cultural knowledge relevant to determining the significance of Aboriginal objects and / or places on or in the vicinity of the subject property.
- 15th June 2018 – email to Albury Local Aboriginal Land Council requesting the names of Aboriginal people who may have cultural knowledge relevant to determining the significance of Aboriginal objects and / or places on or in the vicinity of the subject property. Also, any relevant information held about the cultural significance of the site or land within a few kilometres of it. On 21st June 2018, Mr Sam Kirby of Albury Aboriginal Land Council phoned to advise that their border ends near Culcairn and Holbrook. Hence, they won't need to be involved.
- 15th June 2018 – email to Wagga Wagga Local Aboriginal Land Council requesting the names of Aboriginal people who may have cultural knowledge relevant to determining the significance of Aboriginal objects and / or places on or in the vicinity of the subject property. Also, any relevant information held about the cultural significance of the site or land within a few kilometres of it. It was subsequently decided that Wagga Wagga Local Aboriginal Land Council should be engaged to undertake a site survey. Details of findings are provided later in this section.
- 20th June 2018 – phone call to Andrew Fisher of the Office of Environment and Heritage who asked for a written request for a list of registered Aboriginal parties in Lockhart Shire and people with local knowledge of cultural heritage. He advised that it would be necessary to follow the

consultation guide and other guides. He also noted that it was important to be as inclusive as possible.

- 20th June 2018 – letter from Jodie Rikiti of the Aboriginal Land Rights Act (ALRA) advising that she had searched the Register of Aboriginal Owners and the project area described does not have Registered Aboriginal Owners pursuant to Division 3 of the *Aboriginal Land Rights Act 1983*.
- 20th June 2018 – email received from the Office of Environment and Heritage regarding known Aboriginal parties in the Lockhart local government area. These included:
 - Wagga Wagga Local Aboriginal Land Council
 - Albury and District Local Aboriginal Land Council
- 29th June 2018 - Consultation with Andrew Fisher, Senior Team Leader Planning, South West Branch Office of Environment and Heritage Parties who advised that the parties that might have an interest in the project included:
 - Wagga Wagga Local Aboriginal Land Council
 - Albury Local Aboriginal Land Council
 - Narrandera Local Aboriginal Land Council
 - Yalmambirra
 - Bangerang Aboriginal Corporation (Freddy (Doogalook) Dowling)
 - Bundiyi Aboriginal Cultural Knowledge (Mark Saddler)
- 9th November 2018, emails were sent to:
 - Narrandera Local Aboriginal Land Council
 - Yalmambirra
 - Bangerang Aboriginal Corporation (Freddy (Doogalook) Dowling)
 - Bundiyi Aboriginal Cultural Knowledge (Mark Saddler)

11th November 2018 – Yalmambirra emailed to say: Many thanks for the information. I am satisfied that all has been covered at this point in time. The reps from Wagga Wagga Local Aboriginal Land Council appear to have things covered also. I thank you, on behalf of the Wiradjuri Council of Elders, for engaging in an appropriate manner in consulting with local First Nations peoples and for contacting me.

Appendix G – Wagga Wagga Aboriginal Land Council Site Report



WAGGA WAGGA LOCAL ABORIGINAL LAND COUNCIL

P.O. BOX 6289, WAGGA WAGGA, NSW 2650
TELEPHONE: (02) 6921 4095, FAX: (02) 6921 7625
E-MAIL: waggawaggalalc@bigpond.com

22 October, 2018

Kym Bisset
Managing Director
KBM Farms Pty Ltd
Po Box 14, Henty NSW 2658

Re: Proposed Piggery on the Plan of Lot 1 in DP 1211821 and Lot 1 in DP 373967), Lockhart Shire,

Dear Kym,

Please find enclosed Report and for the above site survey carried out on Thursday 9 August, 2018

Thank you for referring our services to undertake a sites assessment located at 553 Dick Knowbels Road, Munyabla (Lot 1 in DP 1211821 and Lot 1 in DP 373967), Lockhart Shire to determine whether any features of Aboriginal cultural significance will occur during works on your site

This letter is to certify that Mr. Leonard Lyons, & Mr. Darryl Charles, Aboriginal Cultural knowledge holders (ASO) were engaged by the Wagga Wagga Local Aboriginal Land Council & completed the Aboriginal Site Survey for this site on the 9/8/2018, and made the following observations.

1. Purpose of this assessment

The purpose of the inspection was to assess whether there is cultural heritage impact from the proposed development.

As mentioned above a survey was conducted on the 9/8/2018 by Leonard Lyons, Darryl Charles. As well as James Male

Weather conditions were dry. Ground visibility was not great with ground covering vegetation prominent - 70 % estimation was visible.

The survey was undertaken on foot.

The site survey was completed for this site, and the following observations were made.

Regarding any recorded sites on the property (553 Dick Knowbels Road, Munyabla, Lochardt NSW) in AHIMS (Aboriginal Heritage Information Management System), there are none listed or recorded at this point in time.

Recommendation:

- 1) No Aboriginal objects were identified during the survey for the area, Lot 1 in DP 1211821 and Lot 1 in DP 373967, clear of Aboriginal heritage items.
- 2) That once work commences that further investigations are done

If you have any questions, please don't hesitate to give me a call or email.

Kind Regards,

Wagga Wagga Local Aboriginal Lands Council

Appendix H – Bundyi Cultural Services Report

To be provided as separate document.