UAG Bio Nutrients & Ravensworth Ramps Ridge Feedlot

UAG Bio Nutrients Facility

EIS Supporting Documents

Ravensworth
Agriculture Company

EIS Supporting Documentation

UAG Bio Nutrients Facility at Ravensworth Ramp's Ridge Feedlot

Including

- **Noise Assessment**
- **Air Quality Impact Assessment**
- **Input Processing Volumes Statement**
- **Manure Management Statement**
- **EPA Resource Recovery Order and Exemption Requirements**

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On behalf of

UAG BioNutrients

For Development Application: PAN-195579

Date: October 2022

This document provides information to address the intent of Development Application PAN-195579 as agreed to by Ravensworth Agricultural Company.

Executive Summary

In March 2022, UAG Bio Nutrients Limited submitted a development application to construct a bionutrient facility at Ravensworth Ramps Ridge Feedlot located at Lot 2 DP 1245331, Sturt Hwy, Maude NSW. The site is an integrated development in RU1 Primary Production zone, DA: 1990-002, approved to stock 60000 head of cattle at a stocking density of 9m^2/hd.

The proposed UAG Bio Nutrient facility will convert current biosolid waste streams of cow manure and other organic wastes into biogas and organic fertilizer products. Biogas produced at the facility will be used to produce net positive power to the facility, with surplus gas routed to Ramps Ridge combined heat and power generators to produce electricity for use within the feedlot operations. The project is integral to UAG Bio Nutrients' and Ravensworth Agricultural Company's aim to provide state of the art carbon neutral facilities which align with the Federal Governments 2050 net zero emissions target.

This report aims to address the request for additional information received from the NSW Environmental Protection Authority (EPA) for Concurrence and Referral (CNR) No. CNR-45788 and Agency Reference No. A-54311 for the proposed Bio Nutrients Facility, specifically:

- noise assessment in accordance with the Noise Policy for Industry (EPA, 2017) to support the proposal. This noise impact statement describes the noise impacts associated with the construction and operation of the UAG Bio Nutrients facility in accordance with the requirements of the Noise Policy for Industry (EPA, 2017), and other relevant guidelines and documents published by the EPA.
- Air Quality Impact Assessment in accordance with the Approved Methods for the Modelling and Assessment of Air Pollutants in NSW (EPA, 2022).
- Processing Volumes Statement. As per EPA request the provided statement clearly details processing volumes and how they will be achieved, including explanation into materials of differing moisture contents.
- Manure Management Statement. Explanation into the implications of the proposed development on current manure and compost management practices associated with the existing Ravensworth feedlot operation.

- EPA Resource Recovery Framework. Details of the relevant EPA resource and recovery order and exemption requirements that may be applicable for the lawful supply and subsequent land application of organic fertilizer products.

Replacing a part of the currently undeveloped Ravensworth beef feedlot with a UAG Bio Nutrients facility is expected to result in negligible changes to the existing amenity noise levels emitted by the feedlot. Previous DA approval documentation, notably a Statement of Environmental Effects submitted and accepted in 2008 for approval of feedlot expansion, required no noise assessment be conducted on the basis of the vast distance to receptors. As distance to receptors remains unchanged, the attenuation in sound pressure levels due to displacement from source relative to the construction and operation of the UAG Bio Nutrients facility ensure that no receiver-based treatments or controls are warranted. Environmentally sensitive design of the facility ensures operational noise levels are well below ambient feedlot noise levels, eliminating the need for noise mitigation measures for the proposed development.

Air quality in the immediate vicinity is expected to improve resulting from the proposed UAG Bio Nutrients Facility installation, which has been purpose designed to capture and process emissions at every source point. Reduced atmospheric GHG emissions will result from lower volume additions to current feedlot manure compost windrows.

The proposed UAG Bio Nutrients Facility requires no changes be made to existing feedlot manure management practices as only 4% of total manure production will be directed to the facility. Production volumes are addressed herein.

In accordance with the EPA resource recovery framework, The Manure order 2014 and the Manure exemption 2014 apply to the lawful supply of fertilizer from the proposed development. Strict quality control of finished fertilizer products will ensure safe soil application through continuous pathogen testing and nutrient profiling.

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1. Project Location and Existing Environment

Historically the relative aridity of the western Riverina generally precluded closer settlement, with extensive grazing of native chenopod shrublands and riverine woodlands having been the dominant land use subsequent to European settlement. The very limited urban development in the region was likewise focused on towns such as Hay, Balranald and Moulamein, which were service or administrative centres supporting the pastoral activities in the region.

In more recent times some intensive agricultural development, largely in the forms of irrigated cropping and beef cattle feedlots, has taken place in the region. However, despite these changes in land use, properties have generally remained relatively large, with any new urban development confined to the larger population centres, such as Hay.

A number of significant road and rail transport routes do traverse the western Riverina, being of particular importance in respect to interstate transport between the eastern states and South Australia or Western Australia. With the ongoing increase in road transport, towns along the major highways such as Hay and Balranald, have continued to gain importance as service centres for road transport.

Based on the above synopsis, the description of the existing environment provided in the 1990 environmental impact statement for the existing beef cattle feedlot would generally appear to remain valid. Consequently, a detailed description of the existing environment is not reiterated in this document and reference should be made to the earlier document in this respect. Nonetheless, the previous description may be expanded upon or amended where matters of significant variation happen to arise in regard to certain issues.

Ramps Ridge feedlot is located at significant distances from nearest towns and residences, being 55km from Hay, 58km from Balranald, and 16km from Maude, as can be seen in Figure 1. The nearest residence is located 8.35km to the south of the development site. All neighbouring properties are large agricultural holdings. The subject land is zoned (RU1) Primary Production.

Figure 1: Map of proposed Ramps Ridge development site relative to nearest towns.

The Statement of Environmental Effects submitted by Ravensworth Agriculture Company to, and accepted by, the EPA in 2008 for the feedlot expansion included the separation distances from receptors required for both noise and air quality attenuation. The SEE concluded that no receptor would be affected by the noise or air quality impact of the existing development. A comparison of actual and required separation distances for the facility is provided below in Table 1.

Table 1: Displacement of receptors from the developed site and the respective minimum separation distance requirements.

Receptor	Displacement	Required separation distance
Nearest rural residence ('St Pauls')	8.35 km	4.15 km
Hay	55 km	22 km
Balranald	58 km	17 km
Maude	16 km	13 km
Moulamein	51 km	16 km

1. Proposed UAG Bio Nutrient Facility

Noise Impact Assessment

2.1 Current on-site amenity noise levels at the Ravensworth Ramps Ridge feedlot

The current noise levels at the proposed development site are typical of intensive agricultural operations, and have been modelled using Australian Standard AS 2436-2010 (2016), as shown in Table 2. The maximum modelled ambient noise level emanating from the feedlot is expected to be 117dB resulting from earthmoving equipment currently used to collect and move cattle manure into composting windrows. The flaking mill used to process grains for cattle feed has an expected maximum output of 110dB, whilst the current movements of trucks to and within the feedlot (approximately 85 movements per day) record a maximum of 108dB.

Table 2: Current amenity noise levels at Ramps Ridge feedlot

Noise Source	A-weighted sound power levels L_{wA} dB ref: 10^{-12}W	Mid point dB
Cows bellowing	80	80
Flaking mill	80-110	95
Trucks/heavy vehicles (85 per day)	107-108	107
Cars/light vehicles (96 per day)	100-110	105
Tractors/earthmoving machinery	102-117	109
Total (Estimated range)	**80 - 117**	**95**

Monitoring Data for Existing Development

A complaints register is the current means of monitoring noise issues associated with the existing Ravensworth feedlot. The existing facility does not have a history of noise complaints.

Australian Standard 2436-2010(R2016) Table 1 (shown in Table 3) has been used to predictively model the expected noise impact of the UAG Bio Nutrients facility during

Stage 1: Construction, and

Stage 2: Operation

2.2.1 Stage 1 – UAG Bio Nutrients Facility Construction Activities Noise Assessment

Construction of the proposed Bio Nutrients facility is expected to take approximately 6 months from January 2023 through to June 2023. Construction activities associated with **Stage 1** of the development of the proposed UAG Bio Nutrients facility within the Ravensworth Ramps Ridge feedlot boundary are expected to consist of the following major noise generating activities:

- Bulk earthworks
- Crane operations
- Generator operation
- Electric hand tool operation
- Concrete pump truck operation
- Truck movements for construction material delivery

Table 3: Australian Standard 2436-2010(R2016 Typical sound levels of construction plant equipment.

TABLE A1

TYPICAL SOUND LEVELS OF CONSTRUCTION PLANT AND EQUIPMENT*

Plant description	A-weighted sound power levels L_{wA} dB ref: 10^{-12} W		A-weighted sound pressure levels L_{pA} (mid-point) dB at 10 m
	Typical or Range	Typical (mid-point)	
Asphalt paver	103-112	108	80
Asphalt rotomill	111	111	83
Backhoe	100-108	104	76
Backhoe with auger	100-111	106	78
Bulldozer	102-114	108	80
Cherry picker	105	105	77
Compactor	110-115	113	85
Compressor (silenced)	93-110	101	73
Concrete agitator truck	107-111	109	76
Concrete pencil vibrator	101-105	103	75
Concrete pump truck	103-113	108	80
Concrete saw	112-122	117	89
Concrete vibratory screed	115	115	87
Crane (mobile)	95-113	104	76
Crane (tower)	105	105	77
Excavator	97-117	107	79
Filtration unit (40 000 cfm)	109	109	81
Forklift	106	106	78
Front end loader	110-115	113	85
Generator (diesel)	84-113	99	71
Grader	105-115	110	82
Gritblaster (grit & nozzle air noise)	129	129	101
Hand tools (electric)	95-110	102	74
Hand tools (pneumatic)	114-117	116	88

(*continued*)

TABLE A1 (*continued*)

Plant description	A-weighted sound power levels L_{wA} dB ref: 10^{-12} W		A-weighted sound pressure levels L_{pA} (mid-point) dB at 10 m
	Typical or Range	Typical (mid-point)	
Jack hammers	121	121	93
Loader (wheeled)	99-111	105	77
Machine mounted hydraulic drill	110-115	113	85
Machine mounted percussive drill	116	116	88
Machine mounted pneumatic drill	110-121	116	88
Piling (bored)	111	111	83
Piling (impact sheet) (L_{max})	126-147	137	109
Piling (vibratory)	116-133	125	97
Rock breaker	118	118	90
Roller (vibratory)	103-112	108	80
Scraper	116	116	88
Spreader	95	95	67
Truck (>20 tonne)	107	107	79
Truck (dump)	117	117	89
Truck (water cart)	106-108	107	79
Vehicle (light commercial e.g. 4WD)	100-111	106	78
Welder	100-110	105	77

* Information in Table A1 has been derived from a combination of the following sources and further information can be obtained from them:

(a) AS 2436—1981 *Guide to noise control on construction, maintenance and demolition sites*.

(b) BS 5228-1, *Code of practice for noise and vibration control on construction and open sites. Noise*.

(c) DEFRA—Department for Environment Food and Rural Affairs (United Kingdom), Update of noise database for prediction of noise on construction and open sites-Phase 3: Noise measurement data for construction plant used on quarries, July 2006.

NOTE: The sound power data within the column marked 'Typical (mid-point)' can be used to calculate typical noise levels at the nominated assessment locations.

Construction noise levels received by the closest receivers are expected to be negligible due to the vast separation distance of over 8km between receiver and source. Typically, construction noise impacts are estimated on conservative assumptions such as:

- All noise sources operating continuously, or
- All construction noise sources operating simultaneously, or
- All noise sources operating in close proximity to each other, or
- All noise sources operating in close proximity to the nearest noise sensitive receiver, or
- Any combination of some or all of the above.

In reality, none of the above circumstances will ever occur simultaneously in the worst possible combination, however, there will be times (possibly brief) when a combination of factors occur together to create short term high noise emissions from the site. It is, however, unlikely that noise levels from construction will impact on nearby receivers due to the vast separation distances involved.

For this noise impact assessment, rather than predicting noise impacts from individual noise sources, it is considered that it would be more appropriate to predict noise emissions from a fleet of combined plant and equipment which would typically be working together in close proximity during the specific elements or stages of construction, these being:

- Earthworks, shown in Table 4, and
- Facility construction, shown in Table 5.

Table 4: Modelled construction activities – bulk earthworks and drainage infrastructure

Bulk Earthworks and drainage infrastructure	**Sound Power level, dB(A) ref: 10^{-12}W Typical Range**	**Sound Power level, dB(A) ref: 10^{-12}W Typical Mid-point**
Backhoe	100-111	105
Excavator	97-117	107
Bulldozer	102-114	108
Scraper	110-116	113
Front end loader	110-115	113
Total (Estimated range)	**97-116**	**109**

Construction of the proposed UAG Bio Nutrients facility has deliberately been designed to minimize the use of high noise equipment and to ensure fast erection of infrastructure. All steel frame components

will arrive on-site pre-cut and drilled, eliminating the need for grinders and welding equipment. Prefabrication will be employed at every available opportunity.

Table 5: Modelled construction activities – Building and facility construction.

Building and Facility Construction	**Sound Power level, dB(A) ref: 10^{-12}W Typical Range**	**Sound Power level, dB(A) ref: 10^{-12}W Typical Mid-point**
Crane (mobile)	95-113	104
Hand tools (electric)	95-110	102
Generator	84-113	99
Concrete pump truck	103-113	108
Truck movement (>20 tonne)	107	107
Total (Estimated range)	**84-113**	**104**

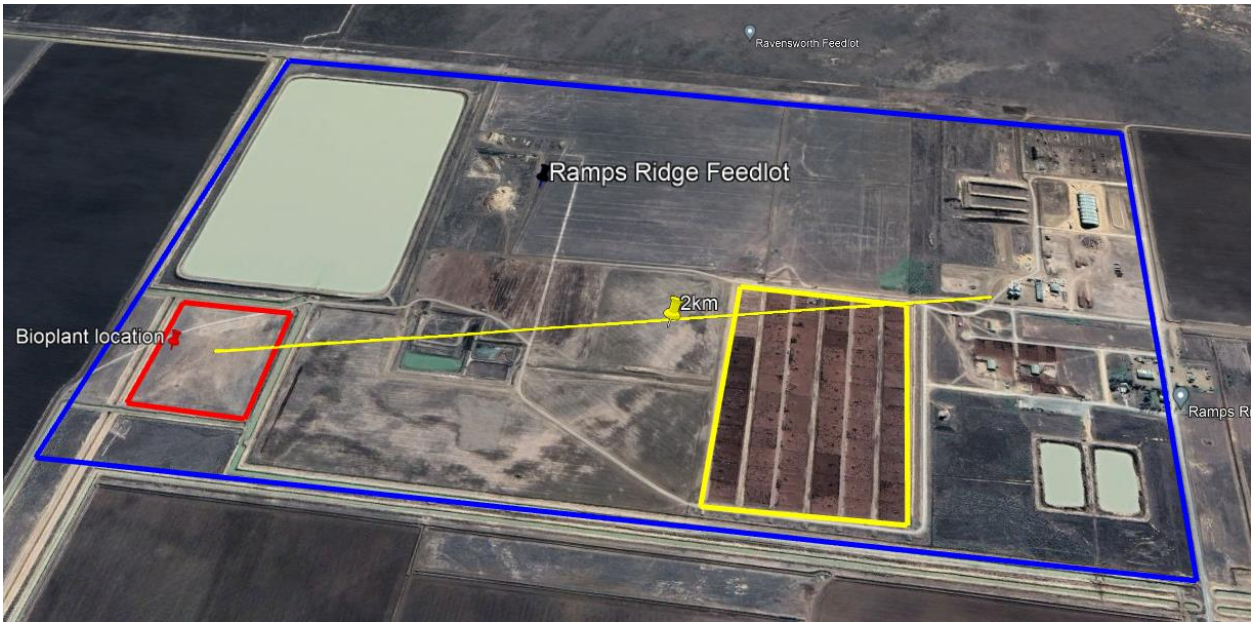

Figure 2: Distance of UAG Bio Nutrients Facility from feedlot operations.

The proposed Bio Nutrients facility is located approximately 2000m from the mid point of the working feedlot operations. In order to calculate the noise impact of the construction of the proposed facility on workers within the Ravensworth Ramps Ridge feedlot at the noted 2000m distance, the Inverse square law can be used. In terms of propagation and attenuation of sound, the inverse square law is a principle in physics whereby a point source emits a sound wave uniformly in all directions (essentially spherically), where the intensity of sound wave energy at any given point away from the source is diminished as a function of the total surface area of the sphere area of the sphere coincident with that point.

To determine sound attenuation over distance using the inverse square law, an idealization needs to be made in which there are no reflective surfaces or barriers between the source and the location at which the sound is being determined.

According to the inverse square law, it can be shown that for each doubling in distance from a point source, the sound pressure level decreases by about 6dB.

2.2.2 Inverse Square Law

$Lp(R2) = Lp(R1) – 20Log_{10}(R2/R1)$

Where

Lp(R1) = Known sound pressure level at the first location (typically measure data or equipment vendor data)

Lp(R2) = Unknown sound pressure level at the second location

R1 = Distance from the noise source to location of known sound pressure level (typically 1m)

R2 = Distance from noise source to the second location

Using the inverse square law calculation and the maximum expected noise emission tabled above, the expected project intrusiveness noise levels experienced by feedlot workers within the feedlot boundary are as follows:

- Bulk earthworks and drainage infrastructure – 43dB(A)
- Building and facility construction – 38dB(A)

Using the inverse square law calculation and the maximum expected noise emission tabled above, the expected project intrusiveness noise levels experienced by the closest residential receiver (8.35km separation distance) are as follows:

- Bulk earthworks and drainage infrastructure – 30.6dB(A)
- Building and facility construction – 25.6dB(A)

2.3 Noise Policy for Industry (2017)

According to **Noise Policy for Industry (2017)**, construction activities are excluded from the policy, as shown below:

Clause 1.5 What has been excluded from this policy?

The policy does not apply to:

- vehicles associated with an industrial premise that are on a public road
- transportation corridors (roadways, railways, waterways and air corridors)
- noise from sporting facilities, including motor sport facilities
- construction activities
- noise sources covered by regulations (domestic/neighbourhood noise)
- blasting activities
- shooting ranges
- internal or occupational noise within any workplace regulated by SafeWork NSW
- wind farms
- amplified music/patron noise from premises including those licensed by Liquor and Gaming NSW.

Therefore noise levels emitting from the construction of the proposed UAG Bio Nutrients facility are exempt from the Noise Policy for Industry regulations.

Further support of the negligible effect of noise emissions from the UAG Bio Nutrients facility construction is confirmed using the following **Noise Policy for Industry (2017)** regulatory guidelines.

2.3.1 *Clause 2.1 Project noise trigger level*

Intrusive noise levels are only applied to residential receivers (residences). For other receiver types identified in Table 2.2, only the amenity levels apply

Project noise trigger level is lowest value of intrusiveness or project amenity noise level after conversion to LAeq,15minute, dB(A) equivalent level

Project noise trigger levels do not apply to the proposed development due to vast separation distance of receivers to source.

2.3.2 *Clause 2.3 Project intrusiveness noise level*

The intrusiveness of an industrial noise source may generally be considered acceptable if the level of noise from the source (represented by the LAeq descriptor), measured over a 15- minute period, does not exceed the background noise level by more than 5 dB when beyond a minimum threshold. This

intrusiveness noise level seeks to limit the degree of change a new noise source introduces to an existing environment.

Project intrusiveness noise level during the construction phase does not exceed the background or ambient noise level by more than 5dB. Project intrusiveness noise level is modelled to be over 50dB lower than the ambient noise levels currently existing within the feedlot boundaries at the described separation distance of 2000m from the construction site.

2.3.3 *Clause 2.4 Amenity noise levels and project amenity noise levels*

Project amenity noise level for industrial developments = recommended amenity noise level (Table 2.2) minus 5 dB(A) The following exceptions to the above method to derive the project amenity noise level apply:

1. In areas with high traffic noise levels (see Section 2.4.1). Noise Policy for Industry 11

2. In proposed developments in major industrial clusters (see Section 2.4.2).

3. Where the resultant project amenity noise level is 10 dB or more lower than the existing industrial noise level. In this case the project amenity noise levels can be set at 10 dB below existing industrial noise levels if it can be demonstrated that existing industrial noise levels are unlikely to reduce over time.

4. Where cumulative industrial noise is not a necessary consideration because no other industries are present in the area, or likely to be introduced into the area in the future. In such cases the relevant amenity noise level is assigned as the project amenity noise level for the development.

The expected resultant project amenity noise level is 10dB or more lower than the existing industrial amenity noise level, and as such classifies as an exception to Clause 2.4.

2.3.4 Stage 2 – UAG Bio Nutrients Facility Operational Noise Assessment

Operation of the proposed Bio Nutrients facility is expected to take effect in June 2023. Activities associated with **Stage 2** of the development of the proposed UAG Bio Nutrients facility within the Ravensworth Ramps Ridge feedlot boundary are expected to be negligible. The facility design incorporates very few mechanical components, mainly screw pumps working at low speed loading for Anaerobic digest agitation, and various pumps for mixing of feedstock before addition to the anaerobic digestion tanks. Noise sources will also include pelletising equipment, combined heat and power

generators (CHP) (x2) for biogas conversion to electricity, various truck movements required for receival of feedstock from onsite feedlot operations, and fertilizer outtake. The entire facility will also be clad with noise insulating material conforming to AS/NZS ISO 717.1:2004 and compliant with P2.4.6(a) and (c) to insulate against the transmission of airborne sound, with a weighted standardized level difference with spectrum adaptation term ($D_{nTw} + C_{tr}$) not less than 45. This cladding is required for climate control within the facility, with the additional benefit of noise insulation. Operation of the UAG Bio Nutrients facility will consist of the following noise generating activities, dB(A) 1m from source, as shown in Table 6.

Table 6: UAG Bio Nutrients Facility Operational Noise Source Levels

Operational Noise Sources	**Sound Power level, dB(A) ref: 10^{-12}W Typical Range**	**Sound Power level, dB(A) ref: 10^{-12}W Typical Mid-point**
Screw pumps	70-80	75
CHP generators	80	80
Electric pumps	75-90	83
Pelletising equipment	70-85	78
Truck movement (<20 tonne)	100-111	106
Truck movement (>20 tonne)	107	107
Total (Estimated range)	**70-111**	**91**
Noise range after insulated cladding attenuation	**25-66**	**46**

Project amenity noise levels from the UAG Bio Nutrients facility operation will be more that 10dB lower than the current amenity noise levels resulting from feedlot operations, which have a range of 80-117dB and a mid range of 95dB.

Truck movements will be below 5 per day, and are expected to cause no additional noise impact considering the feedlot already experiences 85 truck movements per day.

Given that noise sources resulting from the operation of the UAG Bio Nutrients facility will be more than 10dB lower than current amenity noise levels, calculation of distance attenuation requirements by the inverse square law are not necessary.

Noise generated by the operation of the UAG Bio Nutrients facility would not be discernible by the average listener, and therefore would not warrant receiver-based treatments or controls.

2.4 Legislation

2.4.1 Noise Policy for Industry (2017)

Noise from industry can result in adverse effects on surrounding residents if premises have not been designed to mitigate noise.

This policy sets out the NSW Environment Protection Authority's (EPA's) requirements for the assessment and management of noise from industry in NSW. It aims to ensure that noise is kept to acceptable levels in balance with the social and economic value of industry in NSW.

The policy can be used by

- *the EPA when undertaking its regulatory responsibilities under the Protection of the Environment Operations Act 1997 (POEO Act)*
- *large industrial and agricultural premises like mines, quarries and waste facilities that require an environment protection licence from the EPA under the POEO Act*
- *the Department of Planning and Environment when assessing major development proposals under the Environmental Planning and Assessment Act 1979*
- *local councils for assistance with their planning and regulatory responsibilities*
- *community members wishing to find out more about ways in which noise is assessed and measured*

2.4.2 Listing of activities

The activities listed in Schedule 1 of the POEO Act 1997are ***scheduled activities*** for the purposes of this Act. Under the **Protection of the Environment Operations Act 1997 No 156**, the proposed UAG Bio Nutrients facility is not classed as a scheduled activity for which investigation and licencing is required from the EPA.

According to Schedule 1 – Scheduled Activities, Part 1 Premises-based activities, number 17:

17 Electricity generation

(1) *This clause applies to the following activities—*

general electricity works*, meaning the generation of electricity by means of electricity plant that, wherever situated, is based on, or uses, any energy source other than wind power or solar power.*

Under this clause to be classified as a scheduled activity the general electricity works must have the capacity to generate more than 30 megawatts of electrical power.

The activity of the proposed development is not declared to be scheduled activity as it does not have the capacity to generate more than 30 megawatts of electrical power. Under the conditions outlined in the UAG Bio Nutrients EIS, the facility will produce 5668MWH, equating to 0.64MW or 640kW.

Under the **Protection of the Environment Operations Act 1997 No 156**, the proposed UAG Bio Nutrients facility is not classed as a scheduled activity for which investigation and licencing is required. According to Schedule 1 – Scheduled Activities, Part 1 Premises-based activities, number 18:

18 Energy recovery

(1) *This clause applies to the following activities—*

***energy recovery from general waste**, meaning the receiving from off site of, and the recovery of energy from, any waste (other than hazardous waste, restricted solid waste, liquid waste or special waste).*

***energy recovery from hazardous and other waste**, meaning the receiving from on site or off site of, and the recovery of energy from, hazardous waste, restricted solid waste, liquid waste or special waste.*

The activity of the proposed development is not declared to be scheduled activity as it does not satisfy clause 18(1). No general waste is received from offsite, and no hazardous or other waste is received from either on or off site. (Waste definitions are as accorded by the NSW EPA waste classification guidelines Part 1: Classifying Waste.)

According the above scheduled activities definitions, the EPA's requirements for the assessment and management of noise from industry in NSW as applied to large industrial and agricultural premises like mines, quarries and waste facilities that require an environment protection licence from the EPA under the POEO Act does not apply in this instance.

Noise Policy for Industry (2017)

1.1.1 Using the policy in local and regional planning

Put simply, appropriate separation between industrial land uses and sensitive land uses will reduce the potential for noise-related land-use conflicts. Examples of strategic planning initiatives to promote better noise outcomes include:

• *identifying and locating zones in a manner that reduces the potential for land-use conflicts with adjoining land uses or, where these conflicts cannot be avoided by separation alone, applying suitable controls in the planning instruments to ensure compatibility*.

As the closest receiver to the proposed development is located over 8km away from source, separation distance will mitigate the necessity for application of noise control management planning.

1.4 What noise sources does the policy apply to?

The policy applies to industrial noise sources from activities listed in Schedule 1 of the POEO Act and regulated by the EPA. All scheduled activities require an environment protection licence issued under the POEO Act

As previously stated none of the activities associated with the proposed development constitute a scheduled activity under the POEO Act.

2.5 Conclusion

Noise impact assessment for the construction and operation of the proposed UAG Bio Nutrients facility within the Ravensworth Ramps Ridge feedlot boundary was conducted as per EPA request. The noise impact expected from the construction phase is expected to be more than 10dB lower than ambient noise levels currently emitted by feedlot operations. The noise impact expected from the operation of the UAG Bio Nutrients facility is expected to be more than 10dB lower than current ambient noise levels emitted by feedlot operations. Sensitive receivers are located at more than 8km from source effectively attenuating any noise interference from the proposed development. No receiver-based treatments or controls are therefore warranted for the proposed development, and no specific noise mitigation measures need to be adopted for the proposed development to comply with the *NSW Industrial Noise Policy.*

3. UAG Bio Nutrients Facility

Air Quality Impact Statement

3.1 Location Background

The arid nature of the environment in western New South Wales is a contributory factor to the frequent occurrence of dust storms in the region and, in the few centres for which DECC monitoring data are available (*i.e*. Wagga Wagga, Albury, and, for a very limited duration, Griffith), results in the frequent exceedence of NSW air quality goals for the larger airborne particulates (PM10). Aside from the frequent exceedence of PM10 goals, and outside of the larger regional population centres where significant emissions of combustion products might occur, air quality is generally not a major issue in the region.

In more closely settled areas odour may be a significant local issue where receptors are located in close proximity to intensive livestock facilities. However, the large property sizes, and low population densities in the lower Murrumbidgee, mean that odour is typically of lesser significance when compared to closely settled areas of the Riverina, further to the east.

3.1.2 Ambient Air Quality Conditions

Previous air quality impact assessment was submitted as part of SEE for feedlot expansion by E.A. Systems P/L in 2008 which was accepted by the EPA. Appendix K of the SEE provides details of separation distance requirements as determined for the intensive 60 000 head feedlot operating on the Ravensworth site. A comparison of the actual and required separation distances for the feedlot are provided in Table X below.

Table 7: Displacement of receptors from the development site and the respective minimum separation distance requirements.

Receptor	Displacement	Required separation distance
Nearest rural residence ('St Pauls')	8.35 km	4.15 km
Hay	55 km	22 km
Balranald	58 km	17 km
Maude	16 km	13 km
Moulamein	51 km	16 km

In the Queensland '*Reference Manual for the Establishment and Operation of Beef Cattle Feedlots*', Skerman (2000) notes that '… *provided the separation distance is sufficient to limit odour nuisance, adverse impacts because of dust and noise are more than adequately addressed*'. Substantial experience with feedlot developments in New South Wales does not suggest anything to the contrary. This is also consistent with the absence of complaints regarding dust emissions from the existing 60 000 head beef cattle feedlot on the development site.

The predominant dust emissions from beef cattle feedlot are fugitive ones associated with the following:

- Cattle movements across the feedlot pen surfaces;
- Traffic movements on unsealed roads and feed alleys;
- Feed milling operations; and
- Manure and composting handling operations.

Impacts associated with such emissions are typically mitigated by managing moisture levels in the following:

- Manure on the pen surface;
- Surface materials on hardstand areas and other trafficable surfaces;
- Feed ingredients (where practicable); and
- Materials being handled during manure harvesting and composting operations.

The available separation distances satisfactorily mitigate any potential air quality impacts associated with ongoing feedlot operations on the site. However, the application of these separation distances is predicated on the design and management of the existing feedlot development being consistent with those of a Class 1 feedlot (*e.g*. maximum dry manure depth of 50 mm) and a stocking density of 9 m^2/SCU.

Particulate emissions are currently mitigated by managing moisture levels in handled materials and those of trafficable surfaces, as well as applying appropriate speed limits to vehicular movements on unsealed surfaces. Monitoring of the effectiveness of current mitigation measures is provided by the maintenance of a complaints register.

3.1.3 Current Feedlot Waste Management Practice

Waste manure from the feedlot is currently handled onsite. Feedlot yards are scraped periodically using earthmoving equipment (every 30 to 120 days), and manure is removed from yards and composted in open air windrows. The windrows are allowed to compost for periods of up to two months, during which time emissions of methane, carbon dioxide and hydrogen sulfide are released into the atmosphere. Current atmospheric emissions resulting from this methodology are equivalent to 5859 tonnes of carbon dioxide per annum. This practice has been approved by the EPA during previous development applications submitted by Ravensworth Agriculture during the feedlot expansion to 60 000 head capacity. After composting, waste manure is applied directly in the preparation of cropping soils.

3.2 Impact Assessment of proposed UAG Bio Nutrients Facility

By design the proposed UAG Bio Nutrients facility aims to capture all gaseous emissions for conversion into energy. This key principle ensures that all emissions are captured to attain maximum profit from the conversion of waste products into green energy. This ensures both reduced emissions from feedlot compost windrow treatment of waste manure products, and increased energy efficiency through electricity production from organic waste streams currently present on site. The release of gases into the atmosphere is prevented at every opportunity lest these releases negate the effectiveness of the UAG Bio Nutrients facility. As such, general air quality within and around the Ravensworth Ramps Ridge feedlot is expected to improve post project development. Additionally, all air circulated within the facility itself is passed through an activated carbon filtration system, removing odours and capturing any airborne impurities.

3.2.1 POEO (Clean Air) Regulation 2021

Prior to assessing individual process components of the UAG Bio Nutrients facility it is imperative to consult *POEO (Clean Air) Regulation 2021*. In accordance with this act the proposed development:

- does not emit any impurities listed under Division 1 (32) POEO (Clean Air) Regulation 2021 dioxins, furans.

- does not emit any impurities listed under principle toxic air pollutants (a) to (x) Division 1(32) POEO (Clean Air) Regulation 2021.
- does not emit any Type 1 or Type 2 substances, as listed in POEO (Clean Air) Regulation 2021, Division 1(32).
- does not emit any VOC according to definition in POEO (Clean Air) Regulation 2021, Division 1(32), as methane, CO2, CO are not included in VOC definition.
- does not release smoke emissions Division 2 as per Division 2 POEO (Clean Air) Regulation 2021

3.2.2 UAG Bio Nutrient Facility Emission Stage Risks

Key stages of the UAG Bio Nutrients facility which produce gaseous emissions are as follows:

- AD Feedstock Receival area
- Pretreatment tanks and Post Digestion tanks
- AD tanks
- Gas conditioning system
- Compressed gas storage tanks
- CHP units
- BioN Vermiculture room
- Emergency gas release flare

An extensive network of automated gas sensors (methane, carbon dioxide, hydrogen sulphide, oxygen) will be present in each of the areas noted above for monitoring of air quality and work health and safety compliance.

3.2.3 AD Feedstock Receival Area

Feedstock (cow manure) for the anaerobic digestion facility is deposited by tip truck into one enclosed concrete hopper 72m^2. This hopper is fully sealed once the load has been deposited. All gaseous emissions released during this phase are extracted and directed into the fully sealed gas collection system. Gas produced during feedstock receival includes methane, carbon dioxide, and hydrogen sulphide. Feedstock will be processed immediately on receival and will not remain in hoppers for any period exceeding 6 hrs.

***Due to extraction and redirection into the gas conditioning system, there will be zero emissions released into the atmosphere during feedstock receival*.**

3.2.4 Pretreatment Tanks and Post Digestion Tanks

Pretreatment tanks hold feedstock which has been rehydrated with water from the existing effluent pond whilst the feedstock mix is brought up to a temperature equivalent to that of the anaerobic digestion tanks. There will be 3 preparation tanks of 300m^3 each. Post digestion tanks (also 300m^3 each) hold exhausted anaerobic digest whilst its temperature is dropped to ambient temperature. Both pretreatment and post tanks are designed to extract all gaseous emissions and redirect them into the fully sealed gas conditioning system. Gas extracted during the pretreatment phase includes methane, carbon dioxide, and hydrogen sulfide. Digestate held within post tanks is generally exhausted.

***Due to extraction and redirection into the gas conditioning system, there will be zero emissions released into the atmosphere from both pretreatment tanks and post digestion tanks*.**

3.2.5 Anaerobic Digestion Tanks

Anaerobic digestion tanks hold the digestate whilst methanogenesis occurs. Gas produced during this phase includes methane, carbon dioxide, and hydrogen sulphide. Anaerobic digestion tanks will be manufactured onsite to strict structural engineering and analysis standards, and have been subject to Finite Element Analysis. All gas produced within the anaerobic digestion tanks is extracted and redirected to the gas conditioning system.

***Due to extraction and redirection to the gas conditioning system, there will be zero emissions released into the atmosphere from the anaerobic digestion tanks*.**

3.2.6 Gas Conditioning System

All gaseous emissions collected are passed through the gas conditioning system to remove carbon dioxide and hydrogen sulphide, thus improving the purity of methane.

Hydrogen sulphide is removed from the gas stream via chemical sieve containing iron oxide. Adsorption onto iron oxide is a common hydrogen sulphide removal method. The collected hydrogen sulphide is a valuable commodity for resale, and will be stored in accordance with CGA G 12:2011.

Carbon dioxide is removed from the gas stream via pressure swing adsorption. This system uses high pressure causing CO_2 to adsorb onto a zeolite molecular sieve. Pressure swing adsorption is a safe process used extensively for CO_2 separation. All parameters of the installed system will comply with Australian Standard ISO/TS 19883:2017. Collected CO_2 is then passed through a cryogenic system to concentrate and liquify the gaseous product. This CO_2 is of high purity and is a valuable commodity for resale. CO_2 will be stored in accordance with AS 4484:2016. Captured CO_2 will also be used for purging AD tanks of oxygen prior to the digestion process. Excess CO_2 then gets redirected back into the gas conditioning system.

The removal of CO_2 and hydrogen sulphide from the gas stream produces high purity methane, which is then condensed and stored to produce green energy for use within the BioNutrients facility, as well as redirection to the Ravensworth Ramps Ridge feedlot for use within their flaking mills. Storage of methane will be in accordance with AS 1940-2004, AS4332-2004, and AS/NZS 1596:2002

***Due to the condensation and separation methodologies employed within the gas conditioning system there will be zero gaseous emissions released into the atmosphere*.**

3.2.7 Compressed Gas Storage Tanks

All compressed gases will be stored in accordance with AS4332-2004 and AS 3961:2017. Gas lines used for extraction, compression and storage will be in accordance with AS 2885: The standard for gas and petroleum pipelines, and therefore resistant to corrosive substances and high pressure. There will be one CO_2 storage tank of 25000L capacity and one liquified methane storage tank of 25000L capacity.

***Zero gaseous emissions are to be released into the atmosphere from the storage of compressed gas due to strict standard adherence*.**

3.2.8 CHP Units

The proposed development will house 2 combined heat and power generators (CHP units). These units convert the compressed methane into heat and electricity for industrial use. These units typically emit up to 150mg/m^3 of carbon dioxide in their exhaust gases. The exhaust gases from the CHP units will be recirculated into the gas system of the UAG Bio Nutrients facility, capturing all carbon emissions for reprocessing through the gas stream.

***As a result of exhaust redirection into the UAG Bio Nutrients facility gas stream, zero emissions will be released into the atmosphere from the CHP units*.**

3.2.9 BioN Vermiculture Room

The vermiculture facility will consist of 896 BioN modules, each housing approximately 40 000 Eisenia fetida earthworms to process the exhausted digestate. This process transforms the substrate via enzymatic and bacterial addition, mitigating toxicity and producing premium quality, odour free, carbon-based fertilizer. The vermiculture room, by necessity, is totally climate controlled and covered by a biometrics system for biosecurity purposes.

Earthworm respiration occurs through gaseous exchange through general body surface, where O_2 and CO_2 diffuses through the skin. When earthworms process anaerobic digestate CO_2 is deposited back into the soil and cannot escape, which means it has been sequestered by the earthworm. A growing body of scientific evidence suggests that earthworms sequester more CO2 into the soil than they cause to be released into the atmosphere (https://phys.org/news/2013-10-earthworms-sequester-co2.html). Despite this, air quality in this room will still be processed and any CO_2 removed via pressure swing adsorption system. Collected CO_2 will then be condensed cryogenically and stored for resale.

***Due to CO_2 removal during atmospheric conditioning within the BioN vermiculture room, zero gaseous emissions will be released into the atmosphere from this section of the facility*.**

3.2.10 Emergency gas release flare

Gas flares are used in any process that results in the generation and collection of biogas. The proposed Bio Nutrients facility will employ a gas flare to be used as a back-up system during any downtime for maintenance or breakdown of generation equipment. During these circumstances generation of biogas cannot be interrupted and a gas flare is used to maintain the internal pressure on the biological process. All lines associated with the gas collection and conditioning system will have pressure relief valves set at 20kPa, whereby pressure exceedance will trigger flare release. Use of the gas flare is expected to be rare and will adhere to the following ***POEO (Clean Air) Regulation 2021, Division 4, Group 6 treatment plants (50), (51) and (52).*** In this division, Group 6 treatment plant means afterburners and other thermal treatment plant, flares and vapour recovery units

50 Operation of Group 6 treatment plant

An occupier of premises on which any Group 6 treatment plant is operated must ensure that—

(a) any flare operated for the treatment of air impurities is operated in such a way that a flame is present at all times while air impurities are required to be treated, and

51 Residence time

(1) An afterburner, other than one that employs a catalytic control system, must be operated in such a way that the time between an air impurity entering and exiting the afterburner is—

(a) more than 2 seconds if the air impurity originates from material containing any principal toxic air pollutant, or

(b) more than 0.3 seconds in any other case.

(2) An enclosed ground-level flare for the treatment of landfill gas must be operated in such a way that the time between landfill gas entering and exiting the flare is more than 0.6 seconds.

52 Combustion temperature

(1) An afterburner, other than one that employs a catalytic control system, must be operated in such a way that the temperature for the combustion of an air impurity by the afterburner is—

(a) more than 980°C if the air impurity originates from material containing any principal toxic air pollutant, or

(b) more than 760°C in any other case.

(2) An enclosed ground-level flare for the treatment of landfill gas must be operated in such a way that the temperature for the combustion of landfill gas by the flare is more than 760°C.

Adherence to strict POEO regulation requirements will ensure the complete destruction of any toxic elements released during gas line pressure exceedance. Residence time and combustion temperatures will ensure zero release of methane into the atmosphere.

3.3 Emissions Inventory

The Approved Methods for the Modelling and Assessment of Air Pollutants in NSW (2022) requires that an emissions inventory identify the following:

- release type
- location (in metres relative to fixed origin, elevation and discharge geometry)
- potential air pollutants emitted.

Release type

Source configuration may be one of the following types:

Point sources

For a point source, emissions emanate from a very small opening such as a stack or vent. Stacks usually emit hot gases forcefully into the atmosphere at a fixed height above ground level.

There are no point sources of air pollution identified with the proposed development.

Tall point sources

The term 'tall' point source usually refers to sources that protrude out of the surface boundary layer (e.g. over 30 to 50 m tall).

There are no tall point sources of air pollution associated with the proposed development.

Wake-affected point sources

Where nearby buildings interfere with the trajectory and growth of the plume, the source is called a wake-affected point source. A point source is wake-affected if stack height is less than or equal to 2.5

times the height of buildings located within a distance of 5L (where L is the lesser of the height or width of the building) from each release point.

There are no Wake-affected point sources of air pollution associated with the proposed development.

Wake-free point sources

Wake-free point sources are more than 2.5 times the height of the largest nearby building, so that surrounding buildings do not influence the stack top airflow.

There are no wake-free point sources of air pollution associated with the proposed development.

Area sources

An area source has a more realistic two-dimensional structure but only a limited vertical extent. It is a source with a large surface area such as a liquid surface (pond, lagoon) or a landfill surface.

There are no area sources of air pollution associated with the proposed development.

Line sources

A line source is a special case of a long, thin area source. In practice, these sources are taken to be at ground level and thin. A line source becomes an area source if the breadth exceeds 20% of the length.

There are no line sources of air pollution associated with the proposed development.

Volume sources

A volume source is an essentially three-dimensional structure. Usually there are a sufficient number of emission points to consider a uniform emission rate over the full source structure. They are diffuse sources, such as emissions from within a building.

There are no volume sources of air pollution associated with the proposed development.

Calculation of emission concentration is undertaken using the following equation:

$$C_i = \frac{ER_i}{FR}$$

where:

C_i = the concentration of pollutant *i* emitted from a source in mg/m^3

ER_i = the rate pollutant *i* is emitted from the source in mg/s

FR = the gaseous volumetric flow rate in m^3/s

Since all factors of the equation are equal to zero, the concentration of pollutants emitted into the atmosphere by the proposed Bio Nutrients development equals zero. Meteorological data does not therefore need to be analysed to identify transport and dispersion of air pollutants issues. Cumulative air quality impacts do not need to be assessed as there is no release of air pollution from the proposed development. Peak concentrations do not require consideration.

3.4 Conclusion

The proposed Bio Nutrients facility has been purpose designed to capture and process all emissions associated with each phase of the anaerobic digestion process and the vermiculture processing of digestate into odour-free, humus-rich fertiliser. All fixed machinery emissions are redirected into the gas collection and conditioning system for processing, and all internal air quality controls are automated with gas sensor safety systems. A gas flare system will be in place to combust any excess methane during downtime and maintenance. It is expected that the only emissions associated with the proposed development will be those of a very small number of daily truck movements (<5), which will have negligible impact given that the feedlot location currently experiences around 85 truck movements per day. It can be reasonably expected that the large volume of cattle waste being processed and emissions captured through the Bio Nutrients facility will improve air quality in the immediate vicinity through reduced windrowing of manure and the subsequent atmospheric release of methane, carbon dioxide and hydrogen sulphide through this practice. No additional treatments or controls are therefore warranted for the proposed development.

4. UAG Bio Nutrients Facility - Waste Inputs

EPA request was received to clearly detail waste input materials, including a description of each individual waste material, where the waste is sourced from, proposed volumes and associated waste classifications in accordance with the ***Waste Classification Guidelines (EPA, 2014)***.

Feedstock inputs to the Bio Nutrients facility consist of cow manure and waste paper, which is mixed with water from the onsite effluent dam to create the correct consistency slurry for processing. Inputs are detailed below.

Cow manure – Cow manure is received from the Ravensworth Ramps Ridge Feedlot at approximately 20% moisture content. Cow manure feedstock is sourced from current stockpiles/windrows resulting from scraping of cattle feedlot pens.

Annual total input of cow manure is 4375 tonnes at 20% moisture, equating to 3500 tonnes dry weight.

According to the EPA (2014) Waste Classification Guidelines – Part 1: Classifying Waste, Cow manure is classed as **General Solid Waste (putrescible).**

Waste Paper – Waste paper is received from onsite sources (general office and feedlot waste paper). Shortages of paper pulp can be substituted with crop trash, eg: cotton crop leaves and stems, from Ravensworth holdings. Waste paper can include uncontaminated cardboard packaging.

Annual total input of waste paper is 66 tonnes at 10% moisture content, equating to 59.4 tonnes dry weight.

According to EPA (2014) Waste Classification Guidelines – Part 1: Classifying waste, waste paper is classed as **General Solid Waste (Non-putrescible).**

Water – Water for mixing of solid wastes into a slurry of appropriate consistence is sourced from the feedlot's onsite effluent dam. The effluent dam is located next to the proposed development site. The

modelled annual input of water is 4200 tonnes. (Initial operational start up requires 19200tonne of water, 15000tonne of which is recycled back into the system)

5. Processing Volumes

EPA request was received to clearly detail processing volumes and how they are to be achieved, including an explanation of how the Bio Nutrients facility can produce approximately 7600 tonnes of fertilizer with an annual input processing capacity of under 5000 tonnes.

The discrepancy between input and output volumes is due to the rehydration of feedstock, as explained below.

Anaerobic Digestion Input Processing volumes

Feedstock inputs to the AD system are received at different respective wet weights. These need to be converted to dry weight additions to attain correct moisture content of slurry for biological processing, an example of which is provided below.

Table 8: Feedstock wet weight to dry weight conversion

Feedstock	Moisture Content	Wet Weight (T per annum)	X Conversion Factor	Dry Weight (T per annum)
Cow Manure	20%	4375	0.8	3500
Paper Pulp	10%	66	0.9	59
Total (tonne)		4441		**3559**

To this total solids dry weight of 3559 tonnes, 4200 tonne of water is added to achieve a final weight of 7759 tonne, rehydrating the solids to create a slurry of 54% moisture content, as per the equation below.

$$MC\% = \frac{(wet\ weight - dry\ weight)}{wet\ weight}\ x\ 100$$

$$MC\% = \frac{(7759 - 3559)}{7759}\ x\ 100$$

$$MC\% = 54.1$$

Post Digestion Process

After anaerobic digestion is complete, the digestate is processed through the vermiculture system to provide enzymatic and bacterial substrate improvement, and to remove pathogens.

After processing, the total input weight of 7759 tonne digestate slurry is converted into both solid fertilizer and liquid fertilizer, to an approximate ratio of 1.4 liquid to solid, with total weight equaling approximately 7347tonne.

This equates to:

3140 tonne solid fertilizer (pelletised at 30% moisture content)

4207 tonne liquid fertilizer

412 tonne lost as total gas production, general worm population growth, and some evaporative loss.

Slight variations in fertilizer recoveries and gas recoveries are to be expected due to seasonal changes in feedstock received from the Ravensworth Ramps Ridge feedlot.

6. Impact of Bio Nutrients Facility on Manure Management at the Ravensworth Ramps Ridge Feedlot

Cow manure at the Ravensworth Ramps Ridge Feedlot is currently scraped from cattle yards intermittently by skid steer when yards are cleared of cattle, with general collection periods being between 30 to 120 days. Collected manure is subsequently stockpiled in windrows and allowed to compost before being spread on soils in cropping preparation regimes. This manure is used on Ravensworth Agricultural property holdings.

Communications with Ravensworth Agricultural management estimates approximately 4kg manure (dry weight) is produced per head per day. The feedlot carrying capacity is 60 000 head, which equates to approximately 240 tonne of manure per day, and 87 600 tonne of manure produced annually.

The proposed UAG Bio Nutrients Facility aims to process 3500 tonne of manure (dry weight) per year. This equates to only 4% of the total manure output of the Ramps Ridge Feedlot. This is expected to make negligible impact on the current manure handling practice exercised by the feedlot, with no anticipated change imposed on current handling methods.

Manure for the UAG Bio Nutrients facility will be sourced from the existing windrow stockpile practice. Feedstock manure will be loaded from windrows into tip trucks for transport to the facility using existing on farm road infrastructure. Manure sourced from stockpiles has been analysed to be consistently at around 20% moisture content, dependent on local weather conditions, and no process is required to achieve this target moisture content. Upon receival at the UAG Bio Nutrients Facility, moisture content analysis will be conducted to calculate the required feedstock addition weights to attain target dry solids ratios in digestate composition.

It is expected that the proposed UAG Bio Nutrients facility will cause no increase in existing odour levels currently occurring on site, as there will be no change in current manure handling practice. The relatively small fraction of manure to be utilized by the facility (4% of total manure produced) will be moved from one onsite location to another on site location, where it will be placed into a sealed concrete hopper. Gas produced by the manure while in the hopper will be extracted and routed into the

facilities gas collection and conditioning system, effectively removing 4% of feedlot emission and associated odours from current atmospheric release practices.

7. EPA Resource Recovery Framework

Initial EIS preparation did not include details of the relevant EPA Resource Recovery Order and Exemption requirements that may be applicable to the lawful supply and subsequent land application of organic fertilizer products produced from the proposed UAG Bio Nutrients facility.

Applicable Legislation

The NSW EPA Biosolids Order and Accompanying Exemption do not apply as these are relevant to sewerage sludge produced from sewerage treatment plants (STPs) treating purely domestic waste, according to Section 3: Classification of Biosolids Products, in the Biosolids Guidelines (1997).

Under NSW legislation, the applicable order and accompanying exemption are the Manure Order (2014), and the Manure Exemption (2014), as listed below.

7.1 *EPA Resource Recovery Order Part 9, Clause 93 of the Protection of the Environment Operations (Waste) Regulation 2014. The Manure Order 2014.*

1. Waste to which this order applies

1.1. This order applies to manure. In this order, manure means faecal matter generated by any animal other than humans and includes any mixture of animal faecal matter and biodegradable animal bedding such as straw or sawdust.

2. Persons to whom this order applies

2.1. The requirements in this order apply, as relevant, to any person who supplies manure that has been generated, processed or recovered by the person.

By the above definitions, the Manure Order applies to the proposed UAG Bio Nutrients development as the primary feedstock utilized is faecal matter generated by an animal.

The order applies to UAG Bio Nutrients as they supply, in the form of organic fertilizer, processed manure.

7.2 *Resource Recovery Exemption under Part 9, Clauses 91 and 92 of the Protection of the Environment Operations (Waste) Regulation 2014*

The manure exemption 2014

Introduction

This exemption:

- is issued by the Environment Protection Authority (EPA) under clauses 91 and 92 of the Protection of the Environment Operations (Waste) Regulation 2014 (Waste Regulation); and
- exempts a consumer of manure from certain requirements under the *Protection of the Environment Operations Act 1997* (POEO Act) and the Waste Regulation in relation to the application of that waste to land, provided the consumer complies with the conditions of this exemption.

1. Waste to which this exemption applies

1.1. This exemption applies to manure that is, or is intended to be, applied to land as a soil amendment.

1.2. Manure means faecal matter generated by any animal other than humans and includes any mixture of animal faecal matter and biodegradable animal bedding such as straw or sawdust.

2. Persons to whom this exemption applies

2.1. This exemption applies to any person who applies, or intends to apply, manure to land as set out in 1.1.

6. Exemption

6.1. Subject to the conditions of this exemption, the EPA exempts each consumer from the following provisions of the POEO Act and the Waste Regulation in relation to the consumer's actual or intended application of manure to land at the premises:

- section 48 of the POEO Act in respect of the scheduled activities described in clauses 39 and 42 of Schedule 1 of the POEO Act;
- Part 4 of the Waste Regulation;
- section 88 of the POEO Act; and
- clause 109 and 110 of the Waste Regulation. 6.2. The exemption does not apply in circumstances where manure is received at the premises for which the consumer holds a licence under the POEO Act

that authorises the carrying out of the scheduled activities on the premises under clause 39 'waste disposal (application to land)' or clause 40 'waste disposal (thermal treatment)' of Schedule 1 of the POEO Act.

7. Conditions of exemption

The exemption is subject to the following conditions:

7.1. The manure can only be applied to land as a soil amendment.

7.2. The consumer must ensure that any application of manure to land must occur within a reasonable period of time after its receipt.

By the above definitions and conditions, UAG Bio Nutrients qualifies for the Manure Exemption (2014) as the processed manure sold as organic fertilizer is intended to be applied to land as a soil amendment.

7.3 Quality Assurance Program

UAG Bio Nutrients intends to supply a high-quality organic fertilizer capable of restoring depleted Australian soil nutritional profiles and increasing organic carbon content. A rigorous quality control program will be applied to final products to ensure environmental safety, consumer confidence and satisfaction in fertilizer performance.

Product nutritional profiling and strict pathogen control has already been established through analytical testing of final fertilizer products resulting from the UAG research and development facility located at Alstonville NSW. UAG are confident in their products, and have established a testing protocol which will apply to all fertilizer products released from the UAG Bio Nutrients Facility proposed for the Ravensworth Ramps Ridge Feedlot location.

As the UAG anaerobic digestion process is continuous flow, they intend to conduct strict quality control testing for every 500 tonne of solid fertilizer product produced.

Solid fertiliser products will be analysed for total and available nutrients plus heavy metals.

Analysis includes Moisture, pH, EC; TC, TN, TC/TN Ratio, Organic Matter; Total (Ca, Mg, K, Na, S, P, Zn, Mn, Fe, Cu, B, Si, Al, Mo, Co, Se, Cd, Pb, As, Cr, Ni, Hg, Ag); Soluble (Ca, Mg, K, P), Dissolved (NH_4, NO_3, S); Exchangeable (Ca, Mg, Na, K, H, Al, ECEC); Bray I and II Phosphorus; Colwell Phosphorus; Available Micronutrients (Fe, Cu, Mg, Zn, B, Si); TC, TN, TC/TN Ratio, Organic Matter.

Solid and liquid fertilizer products will be analysed for Pathogens

Analysis includes, Ecoli, Faecal Coliforms and Salmonella.

Liquid Fertiliser products will be analysed for total and available nutrients

Analysis includes pH, EC, Total Dissolved Salts (TDS) (by calc.); Total Nitrogen, Total Phosphorus; Sodium, Potassium, Calcium, Magnesium, Sulfur; Silicon, Cobalt, Molybdenum, Zinc, Manganese, Iron, Copper and Boron.