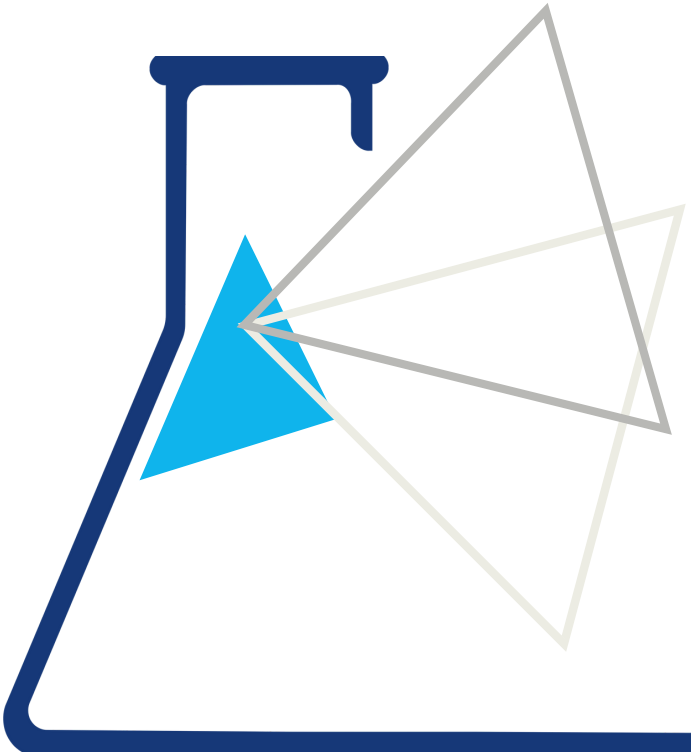


Prepared for:

Goterra

SESL response to EPA Request for Additional Information on Frass

25th September 2023

Attn Mr Volant Wills

Head of Operations

Goterra

Canberra ACT

Dear Sir

You have asked that we provide a response to a letter received from the NSW Environmental Protection Authority (EPA) provided in Attachment 1. In particular, you have asked us to respond to the statements providing their view on the classification of the frass product (insect manure) near the end of page 2.

1. Overview of the process

It is understood that the frass arises from the processing of food waste, mainly from supermarkets. Broadly this waste goes through the following process:

- Solid food waste mixed with packaged food waste is received in small skip bins from the client and deposited in a holding bay.

- The material is picked up using wheel loaders and placed into a hopper that feeds a depackaging machine and then screened to remove the packaging.

- The food waste portion is then liquified and the resulting slurry is pumped into the MIB units containing trays of Black Soldier Fly larva.

- The larva consume the food waste and in doing so excrete "frass" which is the term used for insect manure.

- The mixture is then harvested and the frass is separated from the larvae. The larvae are then cooked and dried to produce an animal protein with a high value.

- At the existing Canberra facility, the current practice is to dry the frass sufficiently to pelletise. It is then pelletised to make an organic fertiliser.

- The pelletising results in elevated temperatures of between 78 and 85 degrees Celsius, cooling to room temperature over about 24 hours, having the same effect as pasteurisation.

Frass may also be composted to heat treat and be provided to composters as a nutrient enhancer. In the new Wetherill Park facility fresh frass will be transported to licenced premises off site and dried or pelletised there.

We understand that the larva may not consume 100% of the food waste input and that minor quantities may form a residue in the frass. This is included in the pelletised frass product. We are asked to assume it may be from 5 to 10% residual food waste.

The two outputs from the process then are high value animal protein which is sold to animal production, and frass which has fertiliser value in agriculture and horticulture.

2. The Manure Order 2014

In our professional opinion, The Manure Order 2014 is the most applicable Resource Recovery Order to the frass product being produced by the proponent. Manure is defined as "faecal matter generated by any animal other than humans," (emphasis added), which ought to be considered to include insect manure (frass). It is not contended that the requirements of the Manure Order apply to the extent permitted under 2.1 to the proponent.

The Manure Exemption 2016 and the Manure Order 2014 applies to manure being applied as a soil amendment. It is contended that neither of the markets the frass is intended to be supplied into constitute use as a soil amendment under the Order. As a heat-treated final fertiliser product, the pellets ought to be treated like any other fertiliser product. Where fresh frass is supplied to a composter, it undergoes further treatment and its inclusion in a final compost mix must be treated in accordance with the Compost Order 2016.

In the event it is determined that the application of pellets does constitute application of manure to land, the proponent believes the requirements of the Manure Exemption are satisfied. Consumers are encouraged to spread the frass promptly by the Safety Data Sheet which is provided upon sale and attached to this letter as Attachment B, as required under 7.2.

It is contended that the Manure Exemption 2016 does permit for the application of fresh frass to land, in the same manner as any other manure, as a soil amendment, as allowed under Section 7. Despite this, the proponent, as outlined, is not intending to provide fresh frass directly as a soil amendment and will ensure that further processing is applied (either pelletising or by sale to a composter) before it can be applied to land.

3. The Compost Order 2016

Consideration has been given to the application of the Compost Order 2016 and the Compost Exemption 2016. Compost is defined in 1.1 of the Order as "any combination of

mulch, garden organics, food waste, manure and paunch that has undergone composting." The proponent does not believe the frass product meets this definitional requirement because:

- frass is not a combination of components; it is pure manure. Whilst it is noted that it cannot be guaranteed that 100% of the food waste is converted by the insect, the remaining food waste is negligible in the chemical makeup of the frass; and

- frass has not undergone composting. The definition for composting given in 6. includes the exclusionary statement that "*Composting does not include drying or dehydration processes*." In the production of pelletised frass, as outlined above, a drying process is employed.

In my professional opinion, the existing orders and exemptions sufficiently cover the product that no further exemptions or orders need be sourced.

4. Protein and Restricted Animal Material

The proponent acknowledges the comment provided by the EPA that "*The protein end product will be classified as restricted animal material (RAM) and must be labelled as such*." A picture of the packaging which will be used for the protein, which clearly indicates the protein is RAM and that it must not be fed to ruminants, is provided in section 7 of this letter 'Animal Protein'.

5. Definition of Waste

The first question that arises is whether the frass is a waste or not. The definition of waste used by the regulator is the Protection of the Environment Operations Act 1997 (POEO Act). In the dictionary to the POEO Act is stated a definition:

waste includes–

> *(a) any substance (whether solid, liquid or gaseous) that is discharged, emitted or deposited in the environment in such volume, constituency or manner as to cause an alteration in the environment, or*
>
> *(b) any discarded, rejected, unwanted, surplus or abandoned substance, or*
>
> *(c) any otherwise discarded, rejected, unwanted, surplus or abandoned substance intended for sale or for recycling, processing, recovery or purification by a separate operation from that which produced the substance, or*

(d) any processed, recycled, re-used or recovered substance produced wholly or partly from waste that is applied to land, or used as fuel, but only in the circumstances prescribed by the regulations, or

(e) any substance prescribed by the regulations to be waste.

A substance is not precluded from being waste for the purposes of this Act merely because it is or may be processed, recycled, re-used or recovered.

6. Frass

Assuming the Frass is a waste. What classification most closely fits the waste and does it benefit from any existing exemption orders.

It is not composted at the point of being pelletised for use as fertiliser so does not benefit from the Compost order 2016 in our view.

It is principally the manure of animal with small quantities of decomposed food waste in it.

The other relevant Order and Exemption is the existing Manure order and exemption 2014 which provides the following definition-

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.

The definition rests on whether Black Soldier fly larva are animals. The scientific classification of the Black Solider fly and larva is as follows:

Kingdom: *Animalia*
Phylum: *Arthropoda*
Class: *Insecta*
Order: *Diptera*

There is no doubt whatever that they are animals and, while such manure may not have been envisaged by the authors of the Order and Exemption, manure from more primitive animals like worms (the manure of which is "worm castings" and widely marketed) would have been recognised by any reasonably informed regulator. Such products are widely sold.

Importantly there is no testing requirements for manures and experience tells us they are full of such organisms as *Escherichia coli (E.coli)* and Salmonella thus there is no requirement for manures to be stabilised. As well, there is no doubt that animal manures and litters would contain some uneaten and undigested portion of their original feed and yet the definition as animal manure and not food waste prevails. It would be inconsistent to treat the small

proportion of uneaten food waste in your product any differently, especially since food waste is exempted completely anyway with no further testing requirements.

I am given the understanding there are two ways research on reuse of the frass product has focussed on:

1. Composting. It has proven an ideal input for composting of other wastes such as green waste and this results in pasteurisation and composting and would fit well within the Compost order and exemption. This would not occur on-site but the unprocessed frass would be shipped to licensed composters.

2. Pelletising. In this process, which has been occurring on-site but could in the future occur off-site by licensed organic processors, the fresh frass is first dried by heating then pelletised into a form acceptable to the horticulture and agriculture markets. During pelletising heat is generated and it is likely this heat that results in pasteurisation and die-off of Salmonella and E. coli. Not, in my view, that this is necessary, animal manures containing very high levels of these are widely sold to farming and even in bagged form in retail garden stores.

That said, the EPA letter implies by way of these words-

> "As the frass has been digested by larvae with no additional treatment it is not appropriate to apply directly to land and requires further processing."

That some higher standard of processing is required of your animal manure than other unprocessed animal manures which is inconsistent with the Manure Order and Exemption which does not require any such further processing.

There is a general duty of care expressed in the past by EPA officers to demonstrate that the manure in question should confer some benefit rather than just represent benign disposal. The attached test result demonstrate benefit is likely to occur from-

- The nitrogen content at 3% is as high as poultry manure a product widely used as fertiliser by the farming community and in retail form as such products as Dynamic Lifter pellets.

- Other mineral plant nutrients such as P, K Ca, S and trace elements are present that will in our experience confer benefits.

- Organic matter and organic carbon that will bring benefit to soil physical properties and soil microbial diversity.

We note the measured heavy metal levels are well under Grade A Biosolids, a commonly applied test for unrestricted sale of organic products.

In our view the product is definitely "animal manure" and these is every indication of benefit. Importantly I do not believe a new "specific exemption" is required for this product and that it is adequately covered by the current Manure Order and Manure Exemption 2014.

When the product is composted further the requirements of the Compost Order and Exemption 2016 would then apply.

7. Animal Protein

Without explaining their reasons or what advice they may have sought the EPA have stated:

> *"The protein end product will be classified as restricted animal material (RAM) and must be labelled as such".*

This is not necessarily true in our view, but this is really a moot point anyway as you have already undertaken to treat it as such and apply the legally required labelling. This is shown in Figure 1.

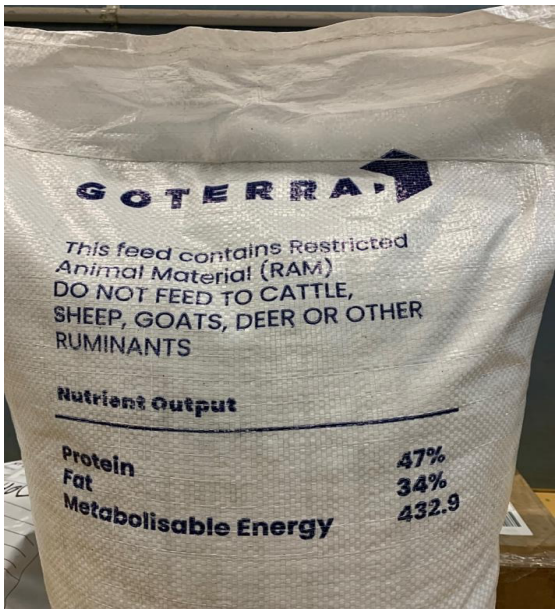


Figure 1 RAM Warning Label on the "Insect Protein" packaging.

The processed larval protein then is already marketed as "Restricted Animal Material" with the legally required labelling. We understand its exclusive market currently is poultry but it has also been researched successfully for feeding to fish. Within the poultry industry it commands a significant value by way of high energy content and high feed conversion ratio.

In no way would this protein be considered a waste and we note the EPA have not suggested this.

Yours sincerely,

Simon Leake

B Sc (Ag) Hons, SSA, CPSS

ABN	WEBSITE	PHONE	EMAIL	HEAD OFFICE/LAB
70 106 810 708	sesl.com.au	1300 30 40 80	info@sesl.com.au	16 Chilvers Rd Thornleigh NSW 2120

Attachment 1

DOC23/769014

Mr Bradley Cutts
General Manager
Fairfield City Council
PO Box 21
Fairfield NSW 1860
Email: mail@fairfieldcity.nsw.gov.au

Attn: Mr Mason Shute
Email: MShute@fairfieldcity.nsw.gov.au

30 August 2023

EIS for Planning Proposal - Goterra Pty Ltd (Integrated Development)
Request for Additional Information

Dear Mr Cutts,

Thank you for the request for General Terms of Approval from the NSW Environment Protection Authority (EPA) dated 17 July 2023 for Concurrence and Referral (CNR) CNR – 58046, A-69137 application DA 219.1/2023 at Unit 3, 132-136 Newton Road Wetherill Park NSW 2164 (Lot 11, DP 747795).

The EPA understands Goterra Pty Ltd (Applicant) submitted a Development Application (Da 219.1/2023) to Fairfield City Council (Council) for carrying out the receival, storage, and processing of compostable waste and the export of fertiliser and protein (the Proposal). The EPA understands that the Proposal includes a composting facility to process up to 4,800 tonnes per annum of received organics in an existing warehouse.

The EPA has reviewed the following documents:

- *Goterra Environmental Impact Statement* – dated July 2023, prepared by Saakshi Sharma and Michael Brewer.
- *Noise Impact Assessment 3/132 Newton Road Wetherill Park NSW 2164* – dated 15 June 2023, prepared by Environmental Monitoring Services.
- *Air Quality Impact Assessment at 3/132 Newton Street Wetherill Park NSW* – dated 11 April 2023, Prepared by Environodour Australia Pty Ltd.
- *BCA Compliance Assessment* – dated 15 June 2023, Prepared by BCA vision.
- *Environmental Management Plan, Goterra Waste Management Facility, Hume, ACT* – dated 24 June 2020, Prepared by Murrang earth sciences.
- *Flood Risk Management Report for Proposed Alterations At Unit 3, 132 Newtown Road Wetherill Park NSW 2620* – dated 23 June 2023, prepared Neilly Davies & Partners Pty Ltd.

The EPA also met with the Applicant on 18 August 2023 to discuss the details of the Proposal.

The EPA requires the Applicant to provide additional information to enable the EPA to adequately assess the Proposal and potential environmental impacts. The information is required to inform licensing considerations consistent with Section 45 of the *Protection of the Environment Operations Act 1997* (POEO Act), including:

a. the pollution caused or likely to be caused by the carrying out of the activity or work concerned and the likely impact of that pollution on the environment,
b. the practical measures that could be taken –
    i. to prevent, control, abate or mitigate that pollution, and
    ii. to protect the environment from harm as a result of that pollution.

In addition, the EPA requests, under Clause 67 of the Environmental Planning and Assessment Regulation 2000, that the Applicant provide the following information.

1. Air

Odour dispersion modelling approach

Emission rates

The EPA understands that the odour emission rates used in Goterra's dispersion modelling are based on monitoring undertaken at a similar facility in Canberra. However, the following should be noted:

- The operating conditions at the time of monitoring have not been described. The Air Quality Impact Assessment (AQIA) does not demonstrate that the monitoring data is representative of reasonable worst-case emissions for the proposal, including emissions from all material handling and processing activities. This includes consideration of the operating conditions at the time of monitoring and how they are representative of operations at the proposed premises.
- It appears that the odour emission rate for each (of the two) exhaust fans has been estimated by dividing the average measured odour concentration (354 OU) by two. However, this underestimates the total mass emission rate, and hence could underpredict potential impacts.
- Whilst it is understood that the two exhaust fans will be fitted with carbon filters, it is unclear if the emissions rates account for these proposed mitigation measures.

The AQIA does not include a modelling scenario representative of worst-case emissions

The dispersion modelling included in the AQIA is based on the average measured odour concentration at the Canberra facility. The use of average data could underpredict potential impacts. Considering the potential odour risk and the proximity to neighbouring receptors, the assessment must include a modelling scenario representative of reasonable worst-case emissions.

The EPA requires the following to be addressed:

a. *Provide detailed information/discussion to demonstrate that the odour monitoring used to inform assumptions made in the preparation of the dispersion modelling is representative of the proposal. Consideration must be given but not necessarily limited to processing quantities and operations (e.g., material handling, sorting, loading, and unloading activities).*
b. *Include a modelling scenario representative of reasonable worst-case emissions, all identified odour sources, their discharge characteristics, and proposed controls. Any input data and assumptions must be accompanied by robust justification and supporting documentation.*
c. *Further information on the 13 stacks and how they have been accounted for in the modelling and additional information on the design of the fitted hoods for the two exhaust fans.*

Additional mitigation measures not provided

The information provided specifies that the exhaust fans and MiBs will be fitted with carbon filters, however, the AQIA identifies other discharge stacks, that have not been accounted for in the assessment. Section 4.7.1 describes another 13 stacks on the roof to help remove baking and product heat. These potential emission

sources have not been accounted for in the modelling and no detailed discussion is provided to justify the exclusion of these sources from the assessment. The EPA understands that emission controls are not proposed for these sources and this needs to be clarified.

Dispersion modelling is based on odour emissions from two odour sources, namely two exhaust fans with vertical discharge. Based on the EPA's meeting with the Applicant held on 18 August 2023, it is understood that the two exhaust fans included in the dispersion modelling will be fitted with hoods, which will reduce the dispersion of odour emissions from the premises. The EPA would like additional information on the design of these hoods to understand how emissions will be released.

It is noted that the AQIA does not include information regarding any feasible contingency and or additional engineering controls that could be implemented if the facility emits offensive odour after it is operational. A facility with no additional feasible odour mitigation measures can present a higher odour risk compared to a facility with such mitigation measures.

If approval is granted, it will be the Applicant's responsibility to comply with Section 129 of the POEO Act. Should odour impacts occur once the facility is operational, the Applicant will need to address these odour impacts and, if necessary, modify the facility based on actual operational outcomes.

The EPA requires the following to be addressed:

a. *The AQIA be revised to demonstrate that the impact assessment criteria can be achieved factoring in the issues identified above.*
b. *Where the revised assessment identifies residual risks for odour impacts, contingency measures that could be implemented once operational should be nominated.*
c. *Provision of additional information relating to the design of the exhaust fan hoods.*

2. End Products

The Applicant needs to consider the end market for the end products being frass and protein. As the frass has been digested by larvae with no additional treatment it is not appropriate to apply directly to land and requires further processing. The protein end product will be classified as restricted animal material (RAM) and must be labelled as such. The Applicant will need to ensure there is an appropriate Resource Recovery Order (RRO) in place for these end products. Where a RRO does not exist, the Applicant can apply for one.

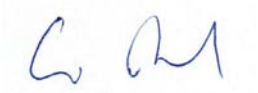
The EPA requires the following to be addressed:

a. *Provide additional information on end market for the protein produced*
b. *Provide additional information on end market for the frass produced*

The required information should be provided to Council in accordance with Clause 110 of the Environmental Planning and Assessment Regulation. The assessment clock shall be stopped until two days after the requested information is provided to the EPA.

If you have any questions about this request, please contact Hannah Lyons on 02 9995 5548 or via email at hannah.lyons@epa.nsw.gov.au.

Yours sincerely



GEORGE OREL
Unit Head - Regulatory Operations
Environment Protection Authority

Attachment 2