

## 16 August 2013

То	Blueprint Planning		
From	David Gamble	Tel	61 2 9239 7354
Subject	Summary of Odour Assessments undertaken for the Proposed Gerogery Organic Composting Facility	Job no.	31/29006

## **Executive Summary**

GHD compiled an Air Quality Assessment (AQA) for the proposed Gerogery Organic Composting Facility as part of the Environmental Impact Statement (EIS) developed for the project. GHD also participated in a series of additional odour investigations instigated by Transpacific Cleanaway (TCL), and provided assistance in responding to NSW EPA information requests in relation to odour. This memo summarises the results of the AQA, additional investigations undertaken and responses provided. The AQA and subsequent investigations confirm that the project will comfortably comply with the relevant project odour criterion and that the AQA presented in the EIS is considered to be conservative.

## Background

GHD was engaged by Transpacific Cleanaway (TCL) to prepare an Environmental Impact Statement (EIS) for a proposed Organic Composting Facility, to be located at Lot 1 DP 174425 and Lot 9 DP 10665, 'Kalawa', 92 Paterson's Road, Gerogery, NSW.

The Director General's Requirements for this project required that an Air Quality Assessment (AQA) be undertaken in accordance with relevant Office of Environment and Heritage guidelines.

This memo has been compiled to:

- 1. summarise the relevant guidelines and project assessment criteria;
- 2. provide a brief summary of the potential sources of odour from the project, together with proposed mitigation and control measures;
- describe the odour investigation and assessment activities undertaken as part of the original AQA (October 2012);
- 4. describe the results of additional investigations undertaken subsequent to the lodgement of the AQA (as provided to the EPA); and
- 5. summarise the key conclusions from the AQA and subsequent investigations.

# 1. Relevant Guidelines and Project Assessment Criteria

The requirements for Air Quality Assessments are provided in the Approved Methods for the Modelling and Assessment of Air Pollutants in NSW (DEC, 2005) and the Assessment and Management of Odour from Stationary Sources in NSW (DEC, 2006).

The assessment process requires amongst other things:

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- quantification of odour emissions (measured in odour units (OU));
- identification of potentially impacted residential or sensitive premises;
- use of meteorological and terrain information to assess the transport and dispersion of odours;
- estimation of odour impacts at the identified residential or sensitive receivers, and the appropriate presentation of this information in this case as concentration (odour unit) contours.

The Approved Methods / Guidelines provide assessment criteria which vary according to the size of the population affected. Stricter criteria (i.e. a lower odour unit threshold) apply where larger populations are likely to be affected. Table 7.5 from the Approved Methods document summarises these criteria.

 

 Table 7.5: Impact assessment criteria for complex mixtures of odorous air pollutants (nose-response-time average, 99th percentile) (EPA 2001)

Population of affected community	Impact assessment criteria for complex mixtures of odorous air pollutants (OU)
Urban ( $\geq$ ~2000) and/or schools and hospitals	2.0
~500	3.0
~125	4.0
~30	5.0
~10	6.0
Single rural residence (≤~2)	7.0

Source: Approved Methods for the Modelling and Assessment of Air Pollutants in NSW (DEC, 2005)

For this project the applicable criteria is the 99th percentile, 1 second average criterion. Due to the low population density surrounding the site, the criteria selected for this project was a single rural residence. This was accepted by the NSW EPA. Odour levels lower than 7 OU would meet the criteria.

# 2. Summary of Project Odour Sources and Proposed Controls

A summary of the *main* project odour sources and the odour mitigation, management and control measures proposed by TCL is provided in the table below:

Source	Odour mitigation and/or control measures
Raw materials generation and transport	Community education in relation to source separation and use of kitchen tidies with starch liners, in-bin combination of garden and food waste which keeps material loose and exposed to oxygen, weekly collections, collection trucks with sealed compartments, scheduling of deliveries to avoid queuing.
Receivals area & feedstock preparation	Inspection of deliveries, with any rejected material being sent to a facility which may lawfully receive it. Prompt processing within a partially enclosed receivals building, cleaning of receivals shed at the end of the day, no on-site storage of material within the shed or in open piles. Feedstock preparation which is appropriate to the carbon to nitrogen ratio of the delivered material and responds to factors such as moisture content and porosity. Use of

	greenwaste material which releases natural deodorising enzymes. Separate batching or food waste/greenwaste and greasetrap waste/greenwaste mixes.
Aerated windrows	Process monitoring and control in conjunction with forced aeration to maintain aerobic conditions with appropriate moisture and temperature levels; Gore® cover system which inhibits the migration of water and odour from the windrow; turning of windrows to maintain porosity.
Stockpiles	Minimisation of finished product storage, monitoring of stockpiles and turning to maintain oxygen levels
General site	Spill management procedures, housekeeping procedures

The AQA modelling considered other sources of odour generation on the site (for example the sedimentation pond). These sources (whilst not presented in the above table) were modelled in the AQA and are not significant in terms of their overall contribution to project odour levels.

TCL maintains certified quality and environmental management systems which would be applied to the project. Considerable monitoring of the compost manufacturing process and the wider site is proposed. Each batch of compost will be tested to confirm that the material is fit for purpose and that the finished product meets the requirements of AS4454-2012.

# 3. Air Quality Assessment (October 2012)

The AQA undertaken for the EIS was consistent with the Approved Methods. The proposed modelling approach was discussed and agreed with the NSW EPA prior to commencement.

The project modelling was undertaken using the following inputs including:

- Meteorology. Wind fields were predicted using the CALMET model supplemented with land use and terrain data from TAPM and using boundary wind field conditions generated by the MM5 model. The CALMET output was validated against the Bureau of Meteorology measured data at Albury Airport.
- Specific Odour Emission Rates (SOERs). SOERs were compiled for each stage of the composting process. The most important SOERs for this AQA are the ones associated with the covered and aerated windrows due to the area they occupy and odour generation potential. At the time of the AQA compilation, the only available source SOER data from Gore® cover composting activities was from a trial conducted at Camden, NSW by a third party. When preparing AQAs it is normal practice to obtain SOER values from other studies where direct measurements have been taken, where the material being processed is similar, and the processing and material handling itself is as similar as possible. Sometimes no relevant data is available because it is a new application, and the closest available data needs to be used.

As part of the modelling process a series of corrections were applied to the SOER data which our air quality specialists believe significantly increases the level of conservatism introduced into the odour emission calculations. A full list of SOER sources used in the AQA, the justification for their use and an explanation of the sources of conservatism introduced into the modelling has been previously provided to the NSW EPA and the EPA has accepted this. • **Dispersion modelling** using the CALPUFF model was used to predict the 99th percentile odour levels and the results compared to the relevant NSW EPA odour criteria.

The results from the AQA modelling conducted for the EIS indicate that the project complies with all EPA Guidelines and relevant assessment criteria. The AQA 99th percentile odour contour map is presented in *Attachment 1*. This map shows the predicted odour contours in relation to the sensitive receptors identified for the project.

It can be seen that there are no sensitive receptors/residential properties within the 7 OU contour (applicable assessment criteria), and only one receptor (the 'Kalawa' landowner's property) which is at the 2 OU contour level. The nearest off-site residences all return predicted levels much less than 2 OU. The 2 OU level is normally applied to urban areas and other sensitive receptors such as schools and hospitals, rather than a sparsely populated area.

## 4. Additional investigations and responses to NSW EPA information requests

The Camden trial from which the original SOER data used in the AQA was obtained, was not conducted by TCL, but by the Camden site operator. In TCL's opinion, the conditions of the trial were not optimal.

Even though TCL was aware that the SOERs derived from the trial were higher than they would have been under optimal composting and monitoring conditions, a decision was made by TCL to ask GHD to use this data in the AQA. The logic behind this was that the SOERs obtained under these conditions would have been conservative, and would therefore simulate the "worst case" odour emission rates that could occur from the proposed operation. Hence the AQA would have a degree of built in conservatism.

In order to confirm that the Camden data was representative, obtain additional data on Gore® cover processes and operations, and address a series of concerns raised by the NSW EPA in terms of source data, TCL undertook some additional odour investigations. These investigations also aimed to provide additional source OER data on the composting processes and materials specifically proposed to be utilised by the Gerogery project.

As the composting process proposed for Gerogery involves the processing of two separate raw material mixes ((1) food and green waste, and (2) partly composted material, shredded green waste and greasetrap waste)), two separate investigations were undertaken:

- Odour emissions were monitored using NSW EPA Approved Methods at TCL's operational facility located at Timaru, New Zealand (which composts food and greenwaste material in proportions similar to that proposed for Gerogery)
- A trial was established at the TCL depot in Wodonga, Victoria (which composted greenwaste and greasetrap waste in proportions similar to those proposed for Gerogery).

Odour emission rate data was collected and compiled for both of these sites. Comparison of this data with the Camden data utilised in the AQA indicated that the SOERs that had been used in the AQA modelling were significantly greater than the more recent SOER data obtained from these new investigations. This further reinforced the view of TCL that the AQA modelling was conservative.

Since lodgement of the EIS, GHD has contributed to two separate submissions which have been provided to the NSW EPA in response to their questions. These responses have been associated with:

• clarifying and justifying the SOERs used in the AQA (Camden and other data)

- clarifying the nature and proportions of the waste types to be processed by the facility
- detailing the levels of conservatism associated with the project modelling, the results of the additional investigations, and justifying TCL's contention that the Camden data and associated modelling represents a 'worst case' scenario.
- confirming the proposed operational and management procedures and contingency measures which would apply to the project.

On the basis of the AQA, and subsequent responses provided in relation to specific questions, the NSW EPA recently issued its General Terms of Approval for the project. This indicates that the EPA is confident that the project is capable of achieving compliance with relevant odour guidelines and criteria.

## 5. Summary of Results

The odour assessment and subsequent investigations undertaken to date confirm that the project will comfortably comply with the relevant project odour criterion (7 OU). Project modelling indicates that the nearest off-site residences all return predicted levels that are much less than 2 OU. This is a level of odour performance that would be required for urban areas and other sensitive receptors such as schools and hospitals.

The AQA presented in the EIS is considered to be conservative and to represent a "worse case" scenario for the project.

The NSW EPA's General Terms of Approval require:

- that the operational odour impacts be verified by a compliance audit; and
- that an air quality and odour management plan be prepared.

This provides additional level of assurance that the project will be designed and operated to prevent the emission of any potentially offensive odour.

Regards

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Att Predicted Maximum Odour Impact (OU) from AQA



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