

ASSESSMENT REPORT

Elf Mushroom Farm and Substrate Plant Project Modified Odour Management System Section 75W Modification - MP 08_0225 MOD 1 and CP 08_0225 MOD 1

1. INTRODUCTION

1.1 Background

This report is an assessment of a request to modify the Project Approval and Concept Plan (MP 08_0225 MOD 1 and CP 08_0225 MOD 1) for a mushroom farm at Londonderry and substrate plant at Mulgrave in the Hawkesbury and Penrith local government areas, respectively. The request has been lodged by Elf Farm Supplies (the Proponent) pursuant to section 75W of the *Environmental Planning and Assessment Act 1979* (EP&A Act). It seeks to modify the approved odour management system at the substrate plant.

Elf Mushrooms and Elf Farm Supplies operate under the umbrella of the Tolson Group, a family owned company that has been producing mushrooms in the Western Sydney area for over 40 years. The Group currently operates three mushroom farms at Vineyard, Londonderry and Glossodia, a packing and distribution company (at its Vineyard mushroom farm) and a mushroom substrate plant at Mulgrave in the Hawkesbury local government area.

1.2 Subject Site operations

The substrate plant at Mulgrave has been in operation since 1981 under a number of consents issued by Hawkesbury City Council (Council) and more recently, an approval by the Minister for Planning 08_0255 granted on 11 January 2012. The Proponent is in the process of surrendering the Council consents in accordance with the Minister's approval. Mushroom substrate is the nutrient rich growing medium used by mushroom farms for growing mushrooms. Raw materials used in substrate manufacture include wheaten straw, water, poultry manure, other recycled agricultural products, gypsum and dry stable bedding. Mushroom substrate production takes approximately six weeks, as described in **Table 1** below.

Table 1: Stages of mushroom substrate production

Stage	Process description
1. Bale Wetting	Straw bales are sprayed with water in the bale wetting area for several days to remove the waxy layer and increase water content. Water draining from the bales is collected, filtered, aerated and re-circulated via the sprays.
2. Pre-Wet	The wet straw bales are laid out in rows in the pre-wet building and blended with raw materials and water.
3. Phase 1 Composting	The pre-wet material is placed into a Phase 1 tunnel (a concrete structure some 50 m long by 8 m wide). The material must remain above 75° Celsius for at least 90 hours to enable the process to reach completion. Part way through the process, the tunnel is emptied and the contents placed in the hopper where water is added uniformly and the mix returned by conveyor to an empty tunnel. The finished Phase 1 product is placed in the hopper so that the conveyor system

	can either load it to trucks for delivery as Phase 1 substrate or transfer it to the Phase 2/3 tunnel building for further processing.
4. Phase 2 Processing	Phase 2 is a pasteurisation process undertaken at high temperature on finished compost to kill unwanted spores and organisms.
5. Phase 3 Processing	Phase 3 is the initial growth of mushroom spawn from introduced mycelium, undertaken in controlled atmospheric conditions.

1.3 Site History

1.3.1 Concept Plan approval

On 11 January 2012, the Minister approved the Concept Plan for the expansion of the substrate plant. The Concept Plan approval facilitated the continued use of the site and its expansion as the relevant local environmental plan at the time of the approval (the *Hawkesbury Local Environment Plan 1989* (LEP 1989)) did not permit the substrate plant in the Rural Living zone.

The LEP 1989 has since been repealed and the portion of the Mulgrave site containing the substrate plant is now zoned Light Industrial IN2 in the *Hawkesbury Local Environmental Plan 2011* (LEP 2011) and is permissible with consent.

1.3.2 Project approval

On 11 January 2012, the Minister concurrently approved a project application for the staged expansion of the processing capacity of the substrate plant including:

- extension of the pre-wet building;
- two additional Phase 1 tunnels;
- two storage sheds for baled straw;
- a second bale wetting area;
- a second Phase 2/3 tunnel building containing 22 tunnels and a storage tunnel;
- a second bio-scrubber with chimney dedicated to treating air exhausted from the pre-wet building; and
- other alterations including a conveyer to transport the pre-wet material to the Phase 1 tunnels, access, parking and drainage systems (see **Figure 1**).

The project consists of 3 stages: the principal effect of stage 1 is to increase the approved production of Phase 1 substrate from 1,000 to 1,600 tonnes per week. Subsequent stages 2 and 3 enable the Proponent to update the factory and stage the increase in production to 2,400 and then 3,200 tonnes of Phase 1 substrate per week.

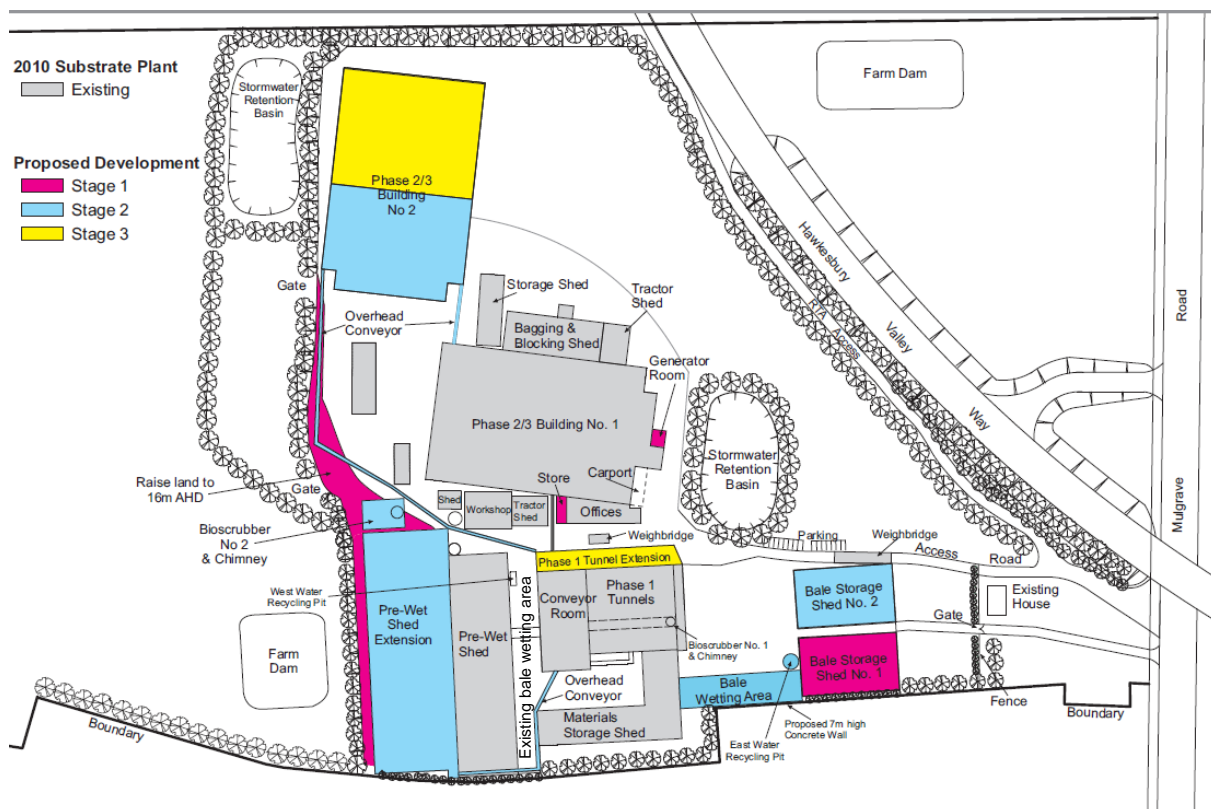


Figure 1: Approved Project, Substrate Plant

1.3.3 Odour management

One of the key issues identified in the original 2011 Ministerial assessment was odour. The production of mushroom substrate is known to be odorous and requires careful management to ensure offensive odours are not emitted off-site.

The closest residential areas are scattered houses in Mulgrave approximately 200 metres (m) to the south-west and a residential housing estate at Windsor approximately 400m to the west. Since operation commenced in 1981, the facility has received numerous odour complaints, however, the Proponent has attributed many of these to other land uses in the vicinity including the sewage treatment plant (see **Figure 2**).

Odour management was addressed by the Project Approval through a number of stringent conditions restricting the incremental increase in production of substrate until satisfactory performance had been demonstrated at each stage. This translated to the requirement to prepare and implement an odour management plan and undertake an independent odour audit prior to applying to the (then) Director-General for approval to increase production. Other identified odour management measures included:

- compliance with the emission limits contained in the EPL for the site;
- storage of the stable bedding in the expanded pre-wet shed extension building;
- complete enclosure of the chicken manure stockpile (if needed); and
- complete enclosure of the bale wetting area (if needed).

Under the existing operation, the main component of the odour management system is the bioscrubber no. 1, approved by Council as part of Council's original consents for the facility. Bioscrubber no. 2, which was approved as part of the Minister's approval (see **Figure 2**), has not been constructed.

On 10 April 2013, the Proponent sought approval to increase Phase 1 substrate production to 1,600 tonnes per week (stage 1) in accordance with the conditions of the Minister's approval. The Proponent completed all the requirements of the approval, including the independent odour audit and Odour Management Plan, to allow an increase in production and as such, the request was approved on 11 July 2013.

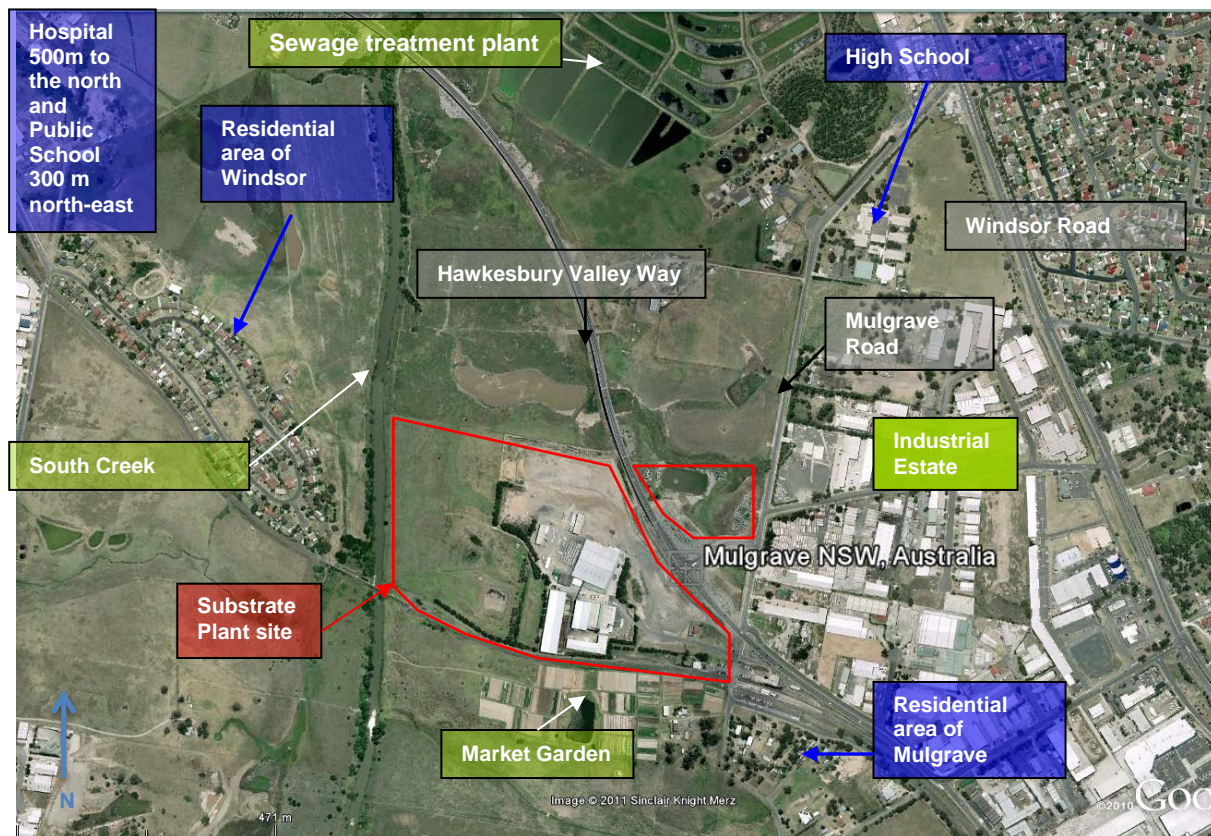


Figure 2: Site location

Although the Proponent advised that air samples taken from the bioscrubber no.1 chimney in accordance with the plant's EPL have demonstrated that the bioscrubber continues to operate in compliance with emission limits, a number of odour complaints have been made by the public. After a series of odour surveys in 2013 and 2014 as well as a report from an independent expert, the Environment Protection Authority (EPA) identified that the main source of odour was air escaping from non-treated sources (fugitive emissions) rather than through the bioscrubber chimney. To address this, the EPA placed three pollution reduction programs (PRPs) on Elf Farm Supplies' licence which required changes to be made to prevent fugitive emissions, including:

PRP 1

- identifying and sealing all potential fugitive odour emission points on the pre-wet building, Phase 1 building, Phase 2 and 3 building, manure storage building, and all external conveyors;

PRP 2

- ensuring negative pressure in pre-wet and Phase 1 buildings under all operating conditions and treatment of air discharges; and
- enclosing the activities of receiving, handling and storing manures, mixing the manure and wetted bale brew and treating emissions from these activities.

PRP 3

The third PRP required the establishment of a community consultative committee (CCC) for a period of two years and implementation of an odour complaints and feedback management system.

In response, the Proponent has undertaken a number of minor repairs to seal all potential fugitive odour emission points in conjunction with some operational procedure changes to address the first PRP. A CCC has been operating since December 2014 which addressed the third PRP.

In order to address the remaining PRP requirements, the Proponent has lodged this modification request to the Minister's approval.

2. PROPOSED MODIFICATION

As part of its commitment to monitor worldwide developments in controlling odour from substrate production, the Proponent has identified recent developments, particularly in Western Europe, which have demonstrated better odour management performance outcomes. These advancements include:

- pre-wet processing in tunnels which allows more effective odour management than using windrows in a large shed; and
- ammonia scrubbers and biofilter beds which are more effective at odour removal than a bioscrubber.

Following this and in response to the EPA's PRPs, on 27 February 2015, the Proponent lodged a modification request under Section 75W of the EP&A Act seeking to allow:

- the pre-wet phase of the operation to be undertaken in tunnels instead of in a pre-wet building;
- the installation of an emissions treatment plant comprising six ammonia scrubbers and a biofilter instead of the existing bioscrubber, and the approved second bioscrubber and chimney stack;
- an extension of both the existing Phase 2/3 building and the approved second Phase 2/3 building by approximately 10 m (increasing the number of tunnels from 22 to 25) to allow a longer residence time of substrate in Phase 2/3 processing; and
- the existing pre-wet shed to be used for bale wetting and stable bedding operations.

The effect of the modification would be to change the method of processing substrate in the pre-wet stage, improve the technology and capability of the odour management system and other minor operational changes to improve the quality of substrate produced.

The proposed changes would mean that, in the longer term, all process operations, including the transfer of compost material throughout the plant, would be undertaken in enclosed buildings and covered conveyors. However, the post 36 hour Phase 2/3 emissions would be vented directly to the atmosphere as the Proponent considers that these emissions are not odourous (see Section 5.2 for a more detailed discussion).

Further details about components of the proposed modification are described below.

2.1 Pre-wet composting

Currently, pre-wet material is stored in a large shed which is designed to be kept under negative pressure and emissions ducted to the bioscrubber. However, the Proponent advises that there have been operational and engineering challenges in maintaining this pressure.

As such, the Proponent now proposes to move the pre-wet composting into a new structure comprising a series of concrete tunnels. The structure would have similar characteristics to the existing Phase 1 tunnel structure on the site.

In particular, the new pre-wet structure would comprise 10 pre-wet tunnels, each 50 metres long and eight metres wide. The tunnels would be arranged in a bank of six at the southern end and four at the northern end of the structure. A working-hall would separate the banks of tunnels. At each end, a plant room would enclose machinery including ammonia scrubbers, tanks, fans and pumps. A four metre wide service corridor along the eastern side of the tunnel structure adjoining

the existing pre-wet building would house a conveyor and miscellaneous rooms for storage and operations (see **Figure 3**).

2.2 Odour Emissions Plant

Primary air treatment would occur via six ammonia scrubbers operating in parallel, with the biofilter providing the secondary treatment.

The ammonia scrubbers, which would be located within the plant room at each end of the pre-wet tunnel structure, would treat and cool the exhaust air. Liquid would be continuously sprayed into the exhaust air stream passing through the biofilter. The liquid is acid dosed as required to maintain the correct pH to keep the ammonia in solution. Ammonium sulfate solution would be created as part of the neutralising reaction and would be recovered either for re-use in the composting process or sale as a fertiliser.

The biofilter, would replace both the existing bioscrubber and chimney and the not-yet-constructed second bio-stack and chimney. The biofilter would consist of a 2,800 m² open swimming pool type structure with concrete sides extending approximately two metres above ground level. Ductwork, partly above and partly below ground, would convey exhaust air from the pre-wet facility and distribute it across the base of the biofilter structure. The biofilter would be filled with organic material including shredded tree stumps, trunks and bark that have proven effective in removing odour from the exhaust air.

While the Proponent has identified the option of a second biofilter as a contingency measure, it does not form part of the proposed modification to the project approval.

The existing bioscrubber would be decommissioned and at this stage mothballed, following completion and commissioning of the works associated with the modification.

Figure 3 shows the footprint of the proposed pre-wet tunnel structure and biofilter.



Figure 3: Proposed Pre-wet Tunnel Structure and Biofilter (inset approved biofilter and pre-wet shed overlaid with proposed modification)

2.3 Phase 2/3 processing

The additional tunnels would allow a longer residence time for the substrate, being an additional day for Phase 2 (pasteurisation) and an additional three days for Phase 3 (initial mushroom spawn). The Proponent advised that additional processing time results in higher yield and improved quality of the mushrooms at the farms.

2.3 Additional minor modifications

The Proponent is seeking the following minor modifications to enable the above changes to operate effectively:

- rearrangement of approved conveyors and construction of additional conveyors see **Figure 4**;
- decommissioning of the bale wetting area and relocation of the bale wetting and the stable bedding area into the existing pre-wet shed. The approved second external bale wetting area and associated water recycling pit would not be constructed;
- enclosure of the raw materials storage area, fit-out with air extraction and connection to the existing pre-wet shed to allow loaders to transport chicken manure between buildings for blending internally;
- installation of a straw bale breaking line in the existing pre-wet shed (proposed bale wetting shed);
- installation of extraction ductwork to deliver all extracted air to the proposed biofilter;
- installation of cooling towers to regulate the exhaust air temperature in the ammonia scrubbers and recycle the heat energy back into the two working halls;
- an electrical switch room and generator room along the eastern wall of the new Phase 2/3 building;
- storage of up to 20 kilolitres of sulfuric acid in tanks;
- generation of ammonium sulfate for sale as a fertiliser;
- landscaping to restrict views from the west and from the Blacktown to Richmond railway line; and
- the ongoing use of the area of the proposed biofilter which has been filled to a depth of seven metres.

Construction would be undertaken in stages as shown in **Figure 4**. All components of the modification are expected to be constructed over a period of 18 months.

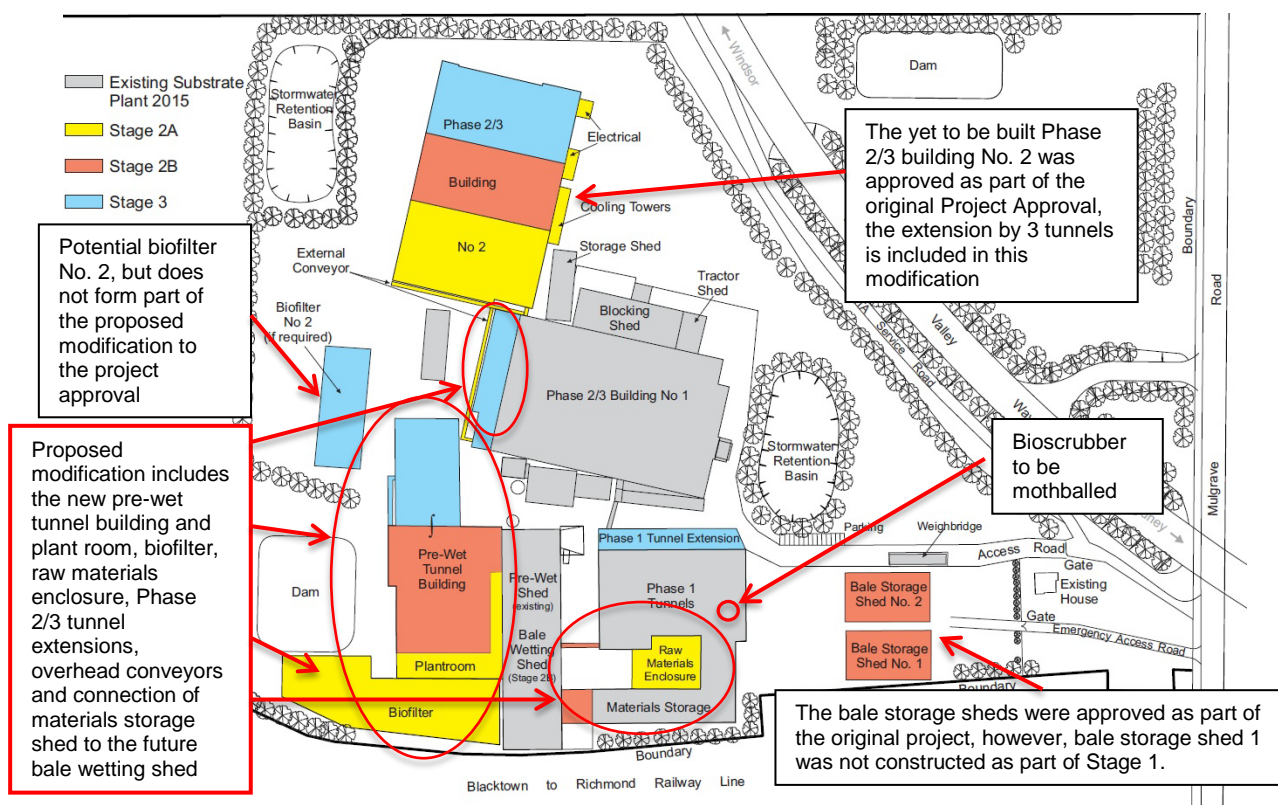


Figure 4: Proposed modification

2.4 Modification to the Concept Plan

Under the *Hawkesbury Local Environmental Plan 2012* (2012 LEP), the mushroom substrate site is zoned Light Industrial IN2 and substrate production is permissible with consent. However, the site of the proposed new biofilter is zoned RU4 Primary Production Small Lots (see **Figure 5**). Rural Industries are not permissible in the RU4 zone. As such, the Proponent is seeking to modify the Concept Plan approval to permit the use of the biofilter for substrate production in the RU4 zone.

The Proponent is also seeking to include a second biofilter in the footprint of the modification to the Concept Plan (see **Figure 4**). This biofilter would also be located in the RU4 zone. However, as the second biofilter is not included in the proposed modification to the project approval, construction and operation would require separate approval.

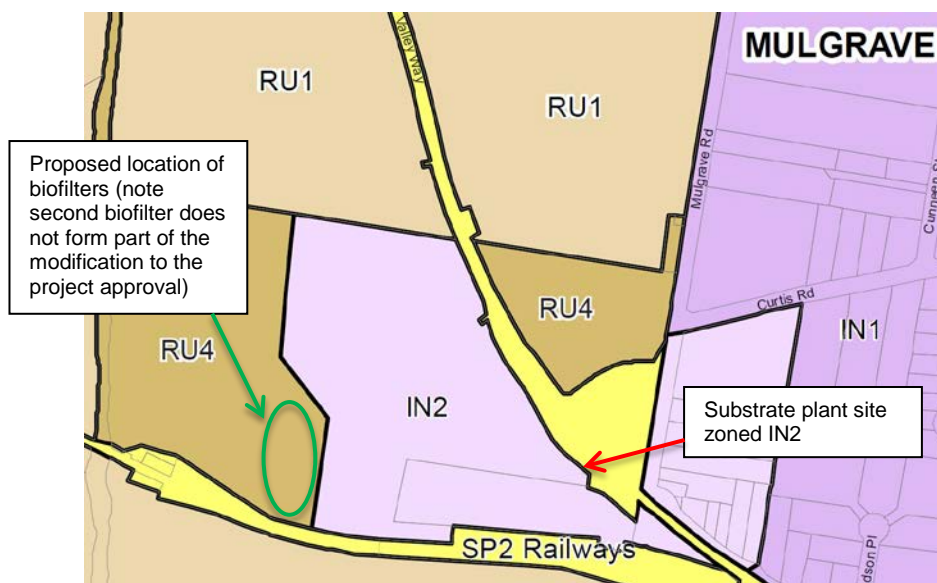


Figure 5: Zoning Map

3. STATUTORY CONTEXT

3.1 Modification request

The approval for the Mushroom Farm and Substrate Plant was granted under Part 3A of the EP&A Act. Although Part 3A was repealed on 1 October 2011, the project remains a 'transitional Part 3A project' under Schedule 6A of the EP&A Act. Consequently, the proposed modification is to be determined under section 75W of the Act.

Pursuant to section 75W(2) of the EP&A Act, the proponent may request the Minister to modify the concept plan and project approval. Any request is to be lodged with the Secretary and a copy of this modification request may be found at **Appendix A**.

Section 75W(3) of the EP&A Act also provides that the Secretary may notify the proponent of environmental assessment requirements (SEARs) with respect to the proposed modification. SEARs were issued on 20 October 2014.

Under Section 75W(4) of the EP&A Act, the Minister may modify the approval (with or without conditions) or disapprove the modification. The following report outlines the Department's assessment of the modification request and recommendation.

3.2 Approval Authority

On 14 September 2011, the Minister delegated the functions to determine section 75W modification requests to the Planning Assessment Commission (the Commission) where reportable political donation disclosures have been made under section 147 of the EP&A Act.

Under the Ministerial Delegation, the Commission can determine the s75W modification request as a reportable political donation disclosure statement was made by the Proponent.

4. CONSULTATION

Under Section 75W of the EP&A Act, the Department is not required to formally notify or exhibit the request. However, due to the potential public interest in the proposal, the Department exhibited the request from 26 March 2015 to 30 April 2015:

- on the Department's website;
- at the Department's information centre; and
- at Hawkesbury City Council's offices.

The Department advertised the public exhibition in the Rouse Hill Times and Hawkesbury Courier, and notified the Environment Protection Authority (EPA) and Council.

In addition, the Department also notified those people that made a submission on the original 2011 application.

During the exhibition period, the Department received six submissions on the proposal: four from the general public, one from the EPA and one from Hawkesbury City Council (see **Appendix B**). Neither Council nor the EPA objected to the request, however, all four general public submissions objected.

4.1 Public Authority Submissions

The **EPA** did not object to the proposal, however, it:

- advised that the information provided was insufficient to allow an adequate assessment of the environmental impacts of the proposal, particularly in relation to the odour impact assessment;

- requested the assessment be updated to use more stringent impact assessment criteria of 2 odour units (OU) for all receivers and to demonstrate that the risk of adverse odour impacts has been minimised; and
- sought clarification on the noise limits sought as part of the modification, noting there may be a non-compliance.

The Department requested that the Proponent address these issues as part of its Response to Submissions.

Council did not object to the proposal, however, it raised concerns over the lack of detail within the site plans making it difficult to assess visual impacts. It also noted that:

- permissibility issues can be addressed via the modification; and
- Fire and Rescue NSW might need to be involved with any future Construction Certificates as the development is subject to a number of alternative solutions to meet the requirements of the Building Code of Australia.

4.2 General Public Submissions

Four public submissions were received during the exhibition of the modification. All four objected to the proposal. Issues raised include concerns over:

- odour;
- the potential increase in production capacity;
- the use of 5 and 2 OU in the odour assessment rather than no odour beyond the boundary;
- permissibility;
- storage of sulfuric acid;
- the removal of the bioscrubber;
- existing night-time noise;
- potential breaches of occupational health and safety; and
- lack of information as to the success of similar operations elsewhere.

The Department has reviewed the concerns raised and is satisfied that:

- the project approval is staged, giving an ultimate production capacity limit of 3,200 tonnes of Phase 1 substrate per week. The modification is not seeking an increase in capacity. Any capacity increase sought by the Proponent would be in accordance with the conditions of the project approval;
- issues relating to permissibility have been addressed in Section 2.4;
- potential breaches of NSW Work Health and Safety legislation is a matter for SafeWork NSW and is outside the scope of this assessment. Notwithstanding, the Proponent has advised that the designed maximum airflow to the biofilter has been based on the requirement to achieve an adequate level of negative pressure inside the processing areas as well as to maintain safe working conditions for operators; and
- modelling has shown that the bioscrubber would not be required once the odour emission control plant is commissioned, however, it would be mothballed rather than removed.

4.3 Response to Submissions

The Proponent lodged a response to submissions report (RTS) on 29 August 2015 to address the issues raised by the EPA, Council and the public. The RTS included:

- an amended odour assessment which provided additional modelling scenarios to show existing baseline conditions, cumulative impacts as well as an assessment against the more stringent 2 OU assessment criteria;
- revised plans;
- scoping and design information for the biofilter;
- a revised Statement of Commitments; and
- aerial images and statistics for European substrate plants with biofilters.

Both the EPA and the Department sought further information from the Proponent regarding this response, including further information on the operation of the biofilter and management of odour and the placement of fill in the location of the proposed biofilter. All outstanding information was provided on 25 January 2016.

The EPA advised it was satisfied that the modification could be approved subject to a number of stringent conditions, primarily relating to the operation of the biofilter and management of odour. The EPA also confirmed it was satisfied that noise from the modified plant would be acceptable.

The EPA's recommended conditions included requirements to:

- maintain and operate the site to minimise the emission of dust;
- carry out odour generating activities on the premises within fully enclosed processing areas;
- engage an independent odour control specialist to review the design of the odour emissions plant and to certify that the 'as built' odour emissions plant has been constructed in accordance with the final detailed design;
- operate and maintain the odour emissions plant in accordance with the manufacturer's specifications, the facility's odour management plan, and as required to maintain effective emission control efficiency of the system to achieve no offensive odour;
- prepare and implement an updated Odour Management Plan;
- construct new structures to prevent corrosion from the internal atmosphere; and
- amend the existing conditions such that there is no increase in throughput until odour control works are validated and approved by EPA.

Two further public submissions were received in response to the RTS report and raised concerns over the following:

- the efficiency of the biofilter, impact of odour from the biofilter and need to discharge through a stack;
- venting of the post 36 hour Phase 2 and 3 emissions;
- handling of sulfuric acid;
- potential health impacts of air emissions, including impacts from the chemical constituents of the air emissions;
- concerns over the potential lag between installation and operation;
- failure to include the hospital and school as receptors in the odour modelling;
- identified exceedances of 2 OU;
- lack of information about the impact of short-term fugitive emissions; and
- lack of discussion on the success of biofilters in Europe.

The Department has reviewed the concerns raised and notes that:

- the Proponent has advised that if approved, the new plant would be constructed and commissioned as soon as possible;
- offensive odours can cause non-specific symptoms such as headaches, nausea and mood alteration which may be associated with the current operation of the substrate plant. As the modification is predicted to achieve a 90% reduction in existing emissions, the aforementioned health impacts are unlikely to exist following the odour management system upgrade;
- the EPA has advised the Department that it is satisfied with the Proponent's assessment of short-term emissions and that the Proponent has installed fast shut opening and closing doors. Short-term fugitive emissions from the opening of doors are unlikely to contribute to odour emissions;
- both the Department and the EPA carefully considered the Proponent's detailed modelling and assessment report which showed that the modification would generally comply with the most stringent odour criteria; and
- **Figure 6** shows that under Scenario 3 (the proposal), emissions at both the school and the hospital would comply with the 2 OU criteria as required by the EPA's *Technical framework*.

All other outstanding issues are discussed in **Section 5** below.

5. CONSIDERATION

During its assessment of the merits of the proposed modification, the Department has reviewed the following:

- environmental assessment and the Director-General's environmental assessment report of the original application;
- existing conditions of approval;
- the EA supporting the proposed modification (Appendix B);
- submissions (Appendix C);
- RTS;
- relevant environmental planning instruments, policies and guidelines; and
- requirements of the Act, including the objects of the Act.

5.1 Modification to the Concept Plan

The modification request seeks to amend the Concept Plan to permit the use of two biofilters in the RU4 zone. Impacts associated with the use of the first biofilter are assessed below, whereas the second biofilter does not form part of the proposed modification to the project approval and will require separate approval at a later date. **Figure 4** shows the location of both biofilters.

Based on the information below, the Department is satisfied that the modification to the Concept Plan is appropriate and the site is capable of having a second biofilter, should the need arise.

5.2 Odour

To assess the impact of odour as a result of the proposed modification, the Proponent engaged The Odour Unit which undertook a detailed odour impact assessment in accordance with the EPA's *Approved Methods for the Modelling and Assessment of Air pollutants in New South Wales 2005* and *Technical framework: assessment and management of odour from stationary sources in NSW (2006)* (Technical Framework). All submissions received during the public exhibition of the modification raised concerns with the current odour emissions from the site, with some submissions questioning the likelihood of success of the proposed technology and others wanting to ensure that the new plant is operated appropriately. The EPA's submission also sought further information, including additional modelling to enable a full assessment of the potential environmental impacts of the modification to be undertaken.

To address these concerns, the Proponent submitted a further odour impact assessment as part of the RTS report. This assessment took a conservative approach assuming a worst case scenario whereby the plant is operating at full capacity and the odour emission from the most odourous day was assumed for every day of the week. Several scenarios were then modelled using the computer based dispersion model CALPUFF to predict ground level odour concentrations from four scenarios at 19 sensitive receivers (see **Figure 6**) including:

- Scenario 1, the base case (current situation at December 2014),
- Scenario 2, an interim phase which would occur after the commissioning of the odour control infrastructure but before the construction of the pre-wet building (Scenario 2 would operate for approximately 18 months);
- Scenario 3, which includes all of the proposed modifications. Scenario 3 models two scenarios being odour from each source (the biofilter and the Phase 2/3 roof vents) modelled separately (3A) and cumulatively (3B); and
- Scenario 4, treatment of all sources of emissions including the post 36 hour Phase 2/3 emissions. This scenario was modelled at the request of the EPA to ensure that all feasible measures to control odour had been identified and assessed. It does not form part of the proposed modification.

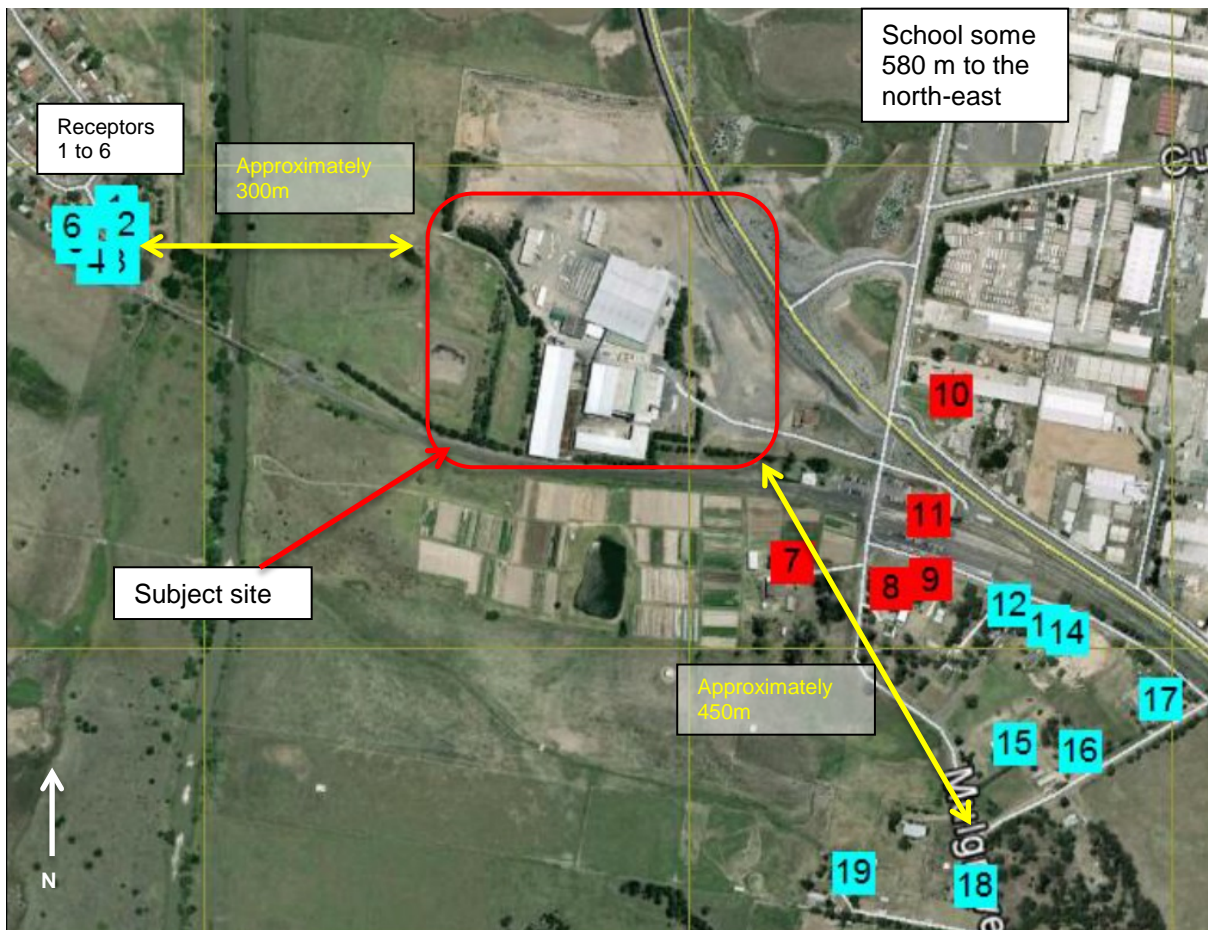


Figure 6: Location of nearest sensitive receivers (near field receivers in red, far field in blue)

The key findings of the odour modelling showed that:

- Scenario 1, the facility is emitting odour at a level that would potentially cause offensive odour, that is, up to 81.9 OU at the nearest sensitive receptor. This is largely due to fugitive emissions as discussed in **Section 1.3.3**;
- Scenario 2, the interim scenario also has the potential to cause offensive odours, however, the model shows that it would be at least half that of what is currently occurring (40.2 OU);
- Scenario 3, with the full implementation of the works associated with the modification and when considering both odour sources together (Scenario 3B), a criterion of 2 OU could be met at the residential receivers (1 to 6) with minor non-compliance of up to 1.5 OU at the semi-rural receivers (7 to 14 and 19) (see **Figure 7**); and
- Scenario 4, with treatment of all emissions, the facility shows similar predictions as was modelled for Scenario 3, however there may potentially be increased odour predictions at residential receivers 1 to 6.

The Proponent has continued to argue that the construction of Scenario 4 whereby all emissions are treated (including Post 36 hour Phase 2/3 emissions), is not warranted given the most odourous parts of the Phase 2 and 3 processing is the first 36 hours of Phase 2 and after this, the odour gradually reduces and stabilises. Furthermore, the results of the modelling show a similar, if not worse outcome (between Scenarios 3B and 4) in certain cases for the nearest sensitive receivers. The Proponent also argued that the two odour sources should be considered separately as they are distinct odours and people will perceive them separately. The Department's consideration of the results and the Proponent's arguments are discussed below.

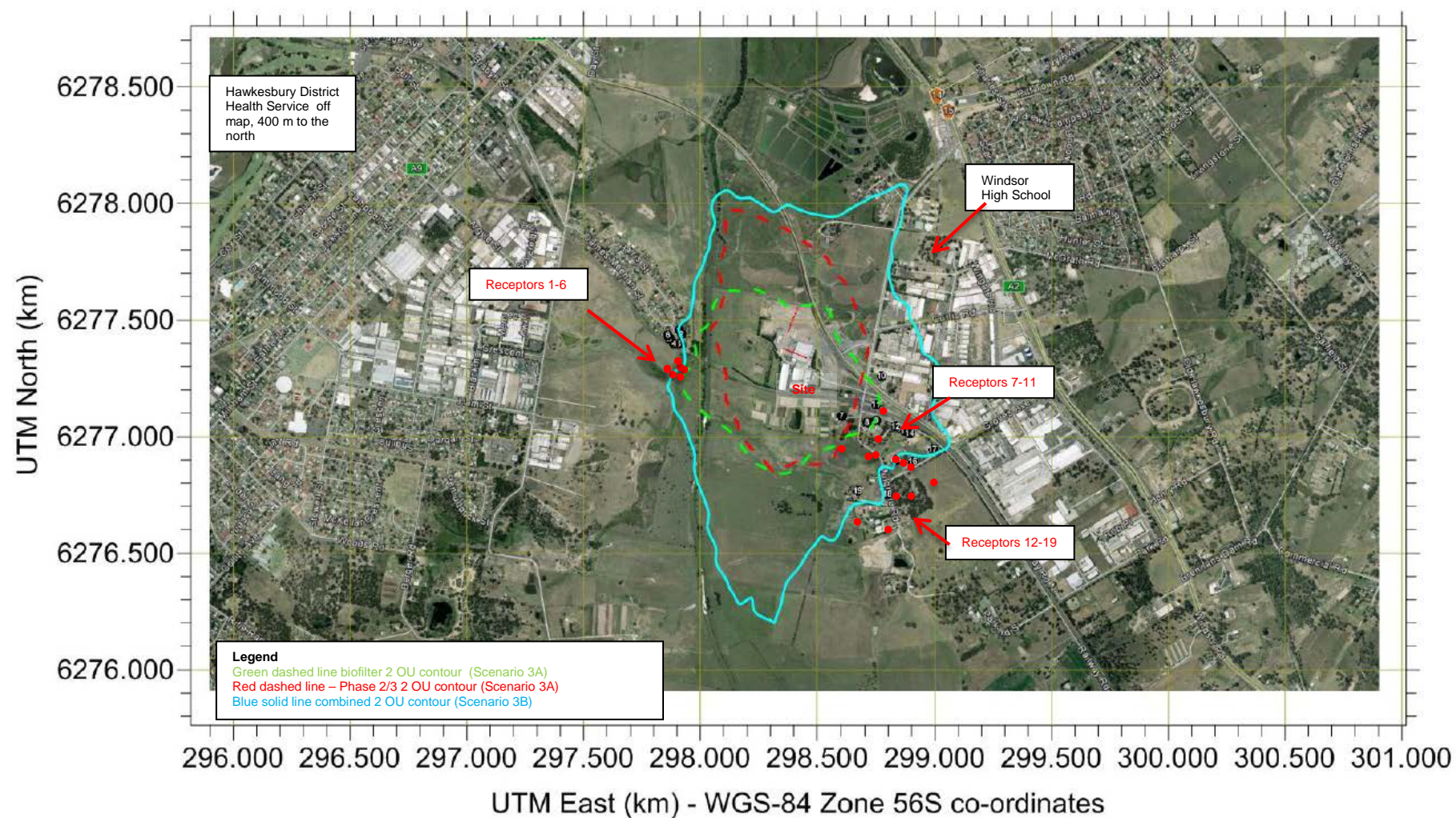


Figure 7: Scenario 3 modelling results

Consideration

The EPA's Technical Framework provides a range of odour assessment criteria based on population densities. The 2012 odour assessment for the project adopted 2 and 7 OU as the assessment criteria based on different land uses in the vicinity of the facility. However, given the history of complaints with the site, and with a view to providing greater certainty that the modified facility would not generate offensive odours beyond the premises once the modification works are complete, the EPA requested that the Proponent adopt the more conservative 2 OU at all receptors in its modelling. The Department considered this to be an appropriate approach.

Whilst the Department received a submission requesting that the facility be required to stop emitting any odour beyond its own boundaries, this is not considered to be an appropriate outcome based on the EPA's policy. In particular, the EPA's Technical Framework states that an odour assessment criterion of 7 OU is likely to represent the level below which 'offensive' odours should not occur for an individual with a standard sensitivity. As shown in the results above, the Proponent predicted that it could achieve the 7 OU and generally the 2 OU at all nearest receivers. In particular, the odour criterion of 2 OU is predicted to be met at both Windsor High School and the Hawkesbury District Health Service (see **Figure 7**).

In considering the results of the odour modelling undertaken as part of this modification, the Department notes that there is the potential for off-site odour impacts to occur under the current operating conditions with the model predicting well in excess of 2 OU at sensitive receptors. Complaints and compliance associated with the current facility are the subject of a separate process being managed by the EPA, in its role administering the POEO Act, and the Department.

For the results of the modelling undertaken for the proposed modification works (Scenario 3A and 3B), the Department is satisfied that the two odour sources (the biofilter and Post 36 hour Phase 2/3 emissions) should be considered cumulatively rather than as separate sources. This is because it is feasible for a receptor to be adversely affected by the increased frequency of odour events due to two odour sources regardless of intensity and/or the synergistic effects of odour emissions of different character. The Department is satisfied that the minor exceedances of the 2 OU criterion are negligible and are unlikely to be perceived or translate to the emission of offensive odour once the works associated with the modification are constructed. This is particularly due to the conservative nature of the odour assessment undertaken by the Proponent.

For the final scenario modelled (Scenario 4), whilst the Department and EPA agree that the capture of all emissions is not required at this time, the EPA does highlight the importance of designing and constructing the facility with the capability of incorporating other contingency measures, should the need arise. Accordingly, the Department recommends that the Proponent prepare a revised Odour Management Plan to detail contingency measures that could be implemented should there be any further odour issues at the site, including the treatment of the post 36 hour Phase 2/3 emissions through the biofilter.

With respect to community concerns regarding the technology proposed and the likelihood of its success, the Department notes that similar systems are in use and operating successfully in other types of developments in Western Sydney including SITA's Advanced Waste Treatment Facility (SAWT) at Kemps Creek and Global Renewables UR-3R waste facility at Eastern Creek. The EPA has requested that if the modification is approved, the Proponent be required to engage an independent odour expert to demonstrate that the detailed design of the odour emissions plant has capacity to meet the performance criteria predicted in the odour assessment. The Department agrees with this approach and recommends this be incorporated into the modified conditions of approval.

Conclusion

The Department acknowledges the concerns raised in the community regarding odour emissions from the existing facility which have largely emanated from fugitive sources, such as poorly sealed buildings. This modification aims to address odour issues through improvements in technology and other operational aspects of the facility.

The Department is satisfied that the assessment has shown that implementation of the works associated with the modification would significantly reduce the odour emissions from the facility by up to 90% when operating at full capacity and would enable compliance with its licence and the project approval. The modification would result in significant improvements and would ensure that all significant sources of odour are captured and treated. While there would be some minor exceedances of 2 OU, it is unlikely these would be detectable. The EPA concurs with this conclusion.

To further address the concerns of the community and ensure the continued implementation of best practice technology, monitoring and management at the site, the Department has recommended a range of additional conditions to strengthen the existing approval. These conditions reflect the recommendations of the EPA and include the following requirements:

- all new buildings to be constructed using non-corrosive materials to ensure seals are kept intact and minimise the potential for fugitive emissions;
- the Proponent to engage an independent odour specialist to:
 - ensure the detailed design of the odour emissions plant has capacity to meet the predicted performance criteria;
 - certify the 'as built' odour emissions plant is in accordance with the final detailed design;
 - undertake odour audits within 6 weeks of commissioning of the odour emissions plant, after six months of operation of the odour emissions plant, prior to seeking approval to increase production and at other times required by the Secretary; and
- preparation of a revised Odour Management Plan to include an odour monitoring program, details of best practice management of odour at the site, triggers for taking remedial and contingency action and the details of those contingency actions such as directing the post 36 hour Phase 2/3 emissions through the ammonia scrubbers and biofilter; and enclosing the west water recycle pit;
- an annual review of the environmental performance of the facility; and
- a biennial independent environmental audit of the performance of the facility.

In recognition that the interim scenario (Scenario 2) might result in the emission of offensive odours, the Department has also recommended a condition requiring completion of the works associated with the modification as quickly as possible, being within two years from the date of approval. The Department has also recommended that the Proponent prepare and implement a comprehensive Community Consultation Strategy which includes the development of a website to inform the community of the progress of the construction works as well as the site's ongoing operations including the results of any audits and all approved management plans.

Overall, the Department is satisfied that the existing and recommended conditions will provide for a comprehensive and robust system to manage the operation of the facility into the future with a greater focus on community consultation and engagement. The revised odour management plan and regular auditing of the facility at key milestones and throughout the life of the facility will ensure that any issues are addressed promptly. The EPA have also identified it is satisfied with the recommended conditions.

The Department's assessment concludes that the proposed design modifications, operational odour control measures and the existing and modified conditions would be adequate for ensuring that odour emissions from the modified Substrate Plant site would not adversely impact off-site receptors.

5.3 Other Issues

A number of other issues were considered as a result of the modification request. These are discussed in **Table 2**.

Table 2: Assessment of Modification

Issue	Assessment	Recommendation																		
Noise	<p><u>Noise limits</u></p> <ul style="list-style-type: none"> The project approval contains noise limits based on the predictions made in the original Environmental Assessment and the EPA's licence. Due to the proposed design changes, the modification request included revised modelling. The revised modelling predicts that the modification may result in a slight increase in the noise emissions, see Table 3, however, it would continue to comply with the project specific noise levels (PSNL) derived under the EPA's Industrial Noise Policy at the nearest residential receivers. The EPA raised no concerns over the change to noise limits and have advised that it will amend the licence to reflect the revised levels. In addition to the requested changes, the EPA recommended an increase to the day time noise limits for R1 and R3-R5 to reflect the PSNL. The EPA also recommended a reduction to the night time noise limit for R3 (see Table 3) to reflect the predictions contained within the revised modelling. <p>Table 3 – Proposed Noise Limits (proposed increase/decrease in brackets)</p> <table border="1"> <thead> <tr> <th>Receiver/Location</th><th>Day /Evening <i>L_{Aeq}(15 minute)</i></th><th>Night <i>L_{Aeq}(15 minute)</i></th></tr> </thead> <tbody> <tr> <td>R1 – 46 Mulgrave Road, Mulgrave</td><td>43 (+1)</td><td>43 (+1)</td></tr> <tr> <td>R2 – Mulgrave Industrial area</td><td>42</td><td>42</td></tr> <tr> <td>R3 – 2 Railway Road, Mulgrave</td><td>42</td><td>37 (-5)</td></tr> <tr> <td>R4 – 126 Mulgrave Road</td><td>44</td><td>41 (+2)</td></tr> <tr> <td>R5 – Chisholm Place, South Windsor</td><td>44</td><td>42 (+3)</td></tr> </tbody> </table> <ul style="list-style-type: none"> The Department's assessment concludes that the minor increase in noise levels is acceptable given that the operation of the facility would still comply with the PSNL. However, the Department has not made the EPA's recommended changes to the day time limits since the Proponent's noise assessment predicted that the site can achieve the more stringent limits at these receivers during the day. While the Proponent did not seek changes to the night time noise limit for R3, the Department agrees that a reduction in the limit, to reflect the predictions in the assessment, is in line with best practice. As such, the Department has recommended that the night time noise limit for R3 be changed from 42 to 37dB(A). One submission raised concerns over night time noise from the existing operations. Although the Department is satisfied that noise impacts from the modification would be minimal, to ensure that the modified facility operates as predicted, the Department recommends that the Proponent revise the Noise Management Plan to include the modification and a revised monitoring protocol. The revised protocol should include a noise audit of the facility once the works 	Receiver/Location	Day /Evening <i>L_{Aeq}(15 minute)</i>	Night <i>L_{Aeq}(15 minute)</i>	R1 – 46 Mulgrave Road, Mulgrave	43 (+1)	43 (+1)	R2 – Mulgrave Industrial area	42	42	R3 – 2 Railway Road, Mulgrave	42	37 (-5)	R4 – 126 Mulgrave Road	44	41 (+2)	R5 – Chisholm Place, South Windsor	44	42 (+3)	<p>The Department recommends that the Proponent:</p> <ul style="list-style-type: none"> Update the Noise Management Plan to reflect the modification and a revised noise protocol that includes a noise audit to be undertaken within three months from the commissioning of the works associated with of the modification. provide the Secretary details of the noise barrier/management measures which includes any modelling required to demonstrate that it would be as effective as the concrete wall.
Receiver/Location	Day /Evening <i>L_{Aeq}(15 minute)</i>	Night <i>L_{Aeq}(15 minute)</i>																		
R1 – 46 Mulgrave Road, Mulgrave	43 (+1)	43 (+1)																		
R2 – Mulgrave Industrial area	42	42																		
R3 – 2 Railway Road, Mulgrave	42	37 (-5)																		
R4 – 126 Mulgrave Road	44	41 (+2)																		
R5 – Chisholm Place, South Windsor	44	42 (+3)																		

Issue	Assessment	Recommendation
	<p>associated with the modification are complete. Any identified exceedances would be rectified in accordance with the recommendations in the audit.</p> <ul style="list-style-type: none"> The Department has also recommended that the Proponent prepare annual reports on the environmental performance of the facility as well as undertake biennial independent environmental audits. These recommended conditions would ensure that the modified facility operates as predicted for the life of the project. <p><u>Noise wall</u></p> <ul style="list-style-type: none"> The project approval contains a requirement to construct a noise wall prior to the commencement of stage 1 construction works. This has not been completed as the bale storage shed, the main component of stage one construction works, has not been constructed. The Proponent is now seeking to modify this condition to allow the installation of other noise mitigation measures with the same or greater effect. The Department considers this request to be appropriate provided the Proponent demonstrates that any proposed structure and/or other mitigation measures are as effective as the wall. The Department has therefore recommended conditions requiring the Proponent to provide further details of the noise management measures prior to commencement of construction of Stage 2B. With the implementation of the existing and recommended conditions, the Department concludes that noise impacts as a result of the modification would be negligible. 	
Stormwater Management	<ul style="list-style-type: none"> The site's approved stormwater management regime is complex. However, all process water is fully consumed in the substrate production. Rainfall from the dirty operational areas drains to the west water recycle pit which is sized to capture the first 10mm of rainfall and, the remainder flows to the western dam. Water in the western dam is either reused in the substrate production or irrigated on the property. The Proponent noted that the modification would not alter the site's overall stormwater management regime. However, there would be some minor amendments including: <ul style="list-style-type: none"> a reduction in the west water recycling pit's catchment; the approved second bale wetting area and associated water pit would not be required; water from the proposed biofilter would be directed to the west water recycle pit, or the western dam in large storm events; and roof area would increase slightly. The Department notes that the EPA is investigating a pollution incident from the western dam which occurred on 21 May 2015 where leachate was discharged to South/Wianamatta Creek. The Proponent has committed to manage the operation to prevent discharge of process water from the site in future and to maximise use of collected and recycled water. The EPA raised no concerns in relation to water and considers that modification would reduce the risk of further pollution incidents associated with the dam. Given the minor changes mentioned above, the Department recommends a condition requiring the Operational Stormwater Management Plan be updated to reflect the modified elements. The Department supports the Proponent's commitment to operate the western dam empty of process water unless during an emergency for example, a plant breakdown or high rainfall event and has reflected this in its recommended conditions. Overall, the Department's assessment has concluded that potential impacts to water would reduce as a result of the modification. 	<p>The Department recommends that the Proponent:</p> <ul style="list-style-type: none"> update the Stormwater Management Plan to reflect the modification; and operate the western dam empty of process water unless during an emergency such as heavy rainfall or plant breakdown.

Issue	Assessment	Recommendation
Flooding	<ul style="list-style-type: none"> The site is located within the South Creek floodplain, the majority of the site has been filled to AHD 16 metres in accordance with a number of Council approvals (DA 218/90, 218/90, M1538/00 and 0571/06) and the project approval. The modification requires an additional 12,000 m³ of fill to build the platform for the biofilter. The Proponent has advised that it has already placed this fill in the proposed biofilter footprint (along with additional fill for landscaping). The fill covers an area of 0.16 hectares at a depth ranging from 0 m to 9 m. In terms of the placement of fill, the Department is currently investigating the matter and will take any necessary action in accordance with its compliance policy. The Proponent has advised that the actual area of fill required by the project is less than anticipated by the original environmental assessment. As such, according to the Proponent's consultant, WMA Water, the modified area of fill would be less than that originally approved and would therefore have no impact on flood levels beyond that originally assessed and approved. WMA has also advised that given the placement of the fill in the lee of the railway embankment, it would not impede flood flows from South Creek. Council raised no issues in relation to flood impacts. Given the above, the Department concluded that there would be negligible impacts on flooding as a result of the modification and recommends the continued use of the fill be accepted. Erosion and sediment control measures in relation to the fill are discussed below. Notwithstanding, the Department recommends that the fill placed for landscaping along the western boundary does not form part of this approval and has recommended a condition to this effect. 	<p>The Department recommends a condition stating that nothing in this approval permits the construction of the landscaped mound along the Substrate Plant's site western boundary identified in the letter from WMA Water dated 21 January 2016.</p>
Hazards	<p><u>SEPP 33</u></p> <ul style="list-style-type: none"> The proposed new acid scrubbers require sulfuric acid. The modification would require the storage of some 20,000 litres of sulfuric acid which is a corrosive substance, classified under the Dangerous Good Code (class 8). The quantity of sulfuric acid to be stored is above the threshold quantities listed in <i>Applying SEPP 33 2011</i> and as such, the development is potentially hazardous. The Proponent did not address <i>State Environmental Planning Policy 33 (Hazardous and Offensive Development)</i> in its assessment. Notwithstanding, the Proponent recognised that there are some hazard issues in relation to the storage of Dangerous Goods and has committed to store and handle the material in accordance with the relevant Australian Standard. On consideration of the characteristics of the material (corrosive with a negligible likelihood of offsite health risks and some potential environmental impacts if not managed appropriately), as well as the relatively small quantities to be stored on site, the Department concluded that this approach is appropriate. The Department has therefore recommended a condition requiring the storage and handling of sulfuric acid in accordance with <i>AS 3780-2008 The Storage and Handling of Corrosive Substances</i>. <p><u>BCA</u></p> <ul style="list-style-type: none"> Council noted that the site is subject to a number of alternative solutions to meet the fire safety requirements of the Building Code of Australia and the Fire and Rescue NSW may need to be consulted. The Department recommends that any alternative solution developed to meet the performance requirements of the BCA is designed in consultation with Fire and Rescue NSW. 	<p>The Department recommends that the Proponent:</p> <ul style="list-style-type: none"> stores and handles sulfuric acid in accordance with <i>AS 3780-2008 The Storage and Handling of Corrosive Substances</i>; and ensures that any alternative solution to the Building Code of Australia, in relation to fire safety, is designed in consultation with Fire and Rescue NSW.

Issue	Assessment	Recommendation
Visual	<ul style="list-style-type: none"> The layout and height of the proposed structures would be similar to the approved structures, with the exception of the biofilter which would extend some 64 metres further east. The Proponent has advised that finishes including materials and colours would be the same as those already constructed on site. Council raised concerns over the conceptual nature of the structure's design which did not enable a full visual assessment. Given the similar nature of the proposed buildings to the approved, the Department concludes that visual impacts would not change beyond those already assessed and approved. Notwithstanding, to provide additional mitigation, the Department has recommended a condition requiring the Proponent to prepare and implement a landscape plan in consultation with Council. The landscaping is to be established prior to the commencement of operation of the works associated with the modification and within three months following construction of the biofilter. 	<p>The Department recommends that the Proponent:</p> <ul style="list-style-type: none"> prepare a Landscape Plan for the site in consultation with Council; and establish landscaping around the site of the biofilter as soon as practicable.
Erosion and sediment control	<ul style="list-style-type: none"> There is potential for erosion from the additional area of fill in the location of the proposed biofilter. Although already placed, the Department has recommended a condition requiring the Proponent to ensure that earthworks associated with the biofilter pad does not act as a source of sedimentation. In addition, the Proponent shall landscape the batters within one week of the commencement of construction. 	<p>The Department recommends that the Proponent:</p> <ul style="list-style-type: none"> ensure that earthworks associated with the biofilter pad does not act as a source of sedimentation; and stabilise the area of fill associated with the biofilter within one week of the commencement of construction.
Administrative errors	<ul style="list-style-type: none"> Condition 4 of Schedule 5 (revision of plans and programs) has a reference to Conditions 4 and 6 of Schedule 6. These conditions do not exist. Therefore, the Department recommends that Condition 4 of Schedule 5 is updated to refer to the correct conditions. 	<p>The condition is recommended to be updated to refer to the correct conditions, being conditions 3, 5 and new condition 3A of Schedule 5.</p>

6. CONCLUSION

The Department has assessed the merits of the proposal in accordance with the requirements of the EP&A Act. This assessment has found that the proposed modification would have negligible impacts beyond those originally assessed and approved. The Department considers that any impacts can be managed by the existing and modified conditions of approval.

The Department acknowledges the concerns raised in the community regarding odour emissions from the existing facility which have largely emanated from fugitive sources, such as poorly sealed buildings. The facility has been the subject of three Pollution Reduction Programs imposed by the EPA to address odour impacts. Whilst some of these requirements have been implemented, this modification attempts to address the balance of the requirements whilst also incorporating technology improvements to reduce the odour impact.

The Department has carefully assessed the modification, in consultation with the EPA, to ensure that it appropriately addresses operational performance issues at the facility. The Department's assessment concludes that the modification would improve the odour performance of the facility by up to 90%. However, the Department has recommended a range of stringent conditions to strengthen the existing approval. The conditions would require the Proponent to:

- engage an independent odour specialist to ensure the detailed design of the odour emissions plant has capacity to meet the predicted performance criteria;
- engage an independent odour specialist to certify the 'as built' odour emissions plant is in accordance with the final detailed design;
- undertake odour auditing of the facility at key milestones of the development to identify if the plant is working as anticipated;
- where necessary, implement any additional measures to reduce odour;
- prepare a revised Odour Management Plan, including an odour monitoring program, details of best practice management of odour at the site, triggers for taking remedial and contingency action and the details of those contingency actions; and
- implement a community consultation program to keep the community informed of the ongoing operation of the facility and the proposed modification works.

The Department's assessment of other issues associated with the proposal concluded that the proposed modification would not alter the environmental outcomes or would result in an improvement, such as for water quality.

The EPA has indicated that with the implementation of the recommended conditions, it is satisfied with the proposed modification and can issue an amended EPL.

Overall, the Department is satisfied that the existing and recommended conditions will provide for a comprehensive and robust system to manage the operation of the facility into the future with a greater focus on community consultation and engagement. Consequently, the Department considers the proposed modification should be approved, subject to amendments to the existing conditions of approval, as set out in the recommended modifying instruments at **Appendix C**.

7. RECOMMENDATION

It is **RECOMMENDED** that the Planning Assessment Commission:

- a) **consider** the findings and recommendations of this report;
- b) **approve** the proposed modifications under Section 75W of the Act; and
- c) **sign** the attached modifying instruments (in **Appendix C**).

Endorsed:



Chris Ritchie
Director
Industry Assessments

19/2/16



Anthea Sargeant
Executive Director
Key Sites and Industry Assessments

19/2/16

APPENDIX A – PROPONENT’S REQUESTS AND RESPONSE TO SUBMISSIONS REPORT

http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=6702
and http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=6969

APPENDIX B – SUBMISSIONS

http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=6702
and http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=6969

APPENDIX C –RECOMMENDED MODIFYING INSTRUMENTS