



TODOROSKI
AIR SCIENCES

FIELD ODOUR SURVEY – ELF FARM SUPPLIES

Elf Farm Supplies

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Field Odour Survey – Elf Farm Supplies

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1 INTRODUCTION

Todoroski Air Sciences has conducted field odour surveys as part of the *Odour Management Plan Elf Farm Supplies Substrate Facility* (**Todoroski Air Sciences, 2017**) at Elf Farm Supplies (EFS), in Mulgrave, New South Wales (NSW).

This report presents the findings of the field odour surveys conducted on 19 February 2019, 8 May 2019, 30 September 2019 and 31 March 2020.

Each field odour survey was conducted at three sites in areas representative of sensitive receptor locations downwind of the EFS site using a simplified VDI (**VDI 3940, 1993**) methodology to determine the extent of, if any, odours detected off-site associated with the EFS site.

This report comprises:

- ✦ A background to EFS and description of the site operations;
- ✦ A brief description of the field odour survey methodology; and,
- ✦ Presentation of the field odour survey findings.



2 BACKGROUND AND SETTING

2.1 Project description

EFS produces mushroom substrate which is a nutrient-rich growing medium used by mushroom farms for growing mushrooms. Mushroom substrate is produced from natural materials, primarily straw and water, with added ingredients of poultry manure, dry stable bedding, gypsum and agricultural meals and by-products. These materials are recycled leftover agricultural products which are used to produce the growing medium (substrate). After harvesting the mushrooms, the spent substrate is then recycled into the landscaping industry.

The facility has been recently updated and features a large new biofilter and ammonia scrubbers to manage odour. The previous bio-scrubber and associated chimney has been decommissioned.

2.2 Project location

The EFS site is located at 108 Mulgrave Road, Mulgrave, situated alongside a main road and a railway line. The surrounding land use features include an industrial/commercial area, a train station, a market garden and residential areas positioned to the northwest and southeast of the EFS site (refer to **Figure 2-1**). The new biofilter is located in the southwest corner of the site, adjacent to the Blacktown - Richmond railway line.



Figure 2-1: EFS location and setting

3 SURVEY METHODOLOGY

The field odour survey methodology is based on a simplified version of the German Standard VDI 3940 "Determination of Odorants in Ambient Air by Field Inspections". This prescribes a methodology for the quantification of odour by field observers (assessors) in relation to odour frequency, intensity and characteristics.

The purpose of the field odour surveys is to determine if offensive odours arising from the MOD 1 Project can be detected off-site.

3.1 Odour intensity and descriptor

During the field odour survey, a measurement is taken at each location over a period of 10 minutes. The assessor tests the ambient air at 10-second intervals with the intensity of the odour and the odour characteristic observed during this time recorded.

Table 3-1 and **Table 3-2** below present the odour intensity rating scale and odour characteristic descriptors, respectively, applied for the field odour survey.

Table 3-1: Odour intensity rating scale

Rating	Intensity description
0	No odour
1	Very slight
2	Slight
3	Distinct
4	Strong
5	Very strong
6	Extremely strong

Table 3-2: Odour characteristic descriptors

Odour type code	Odour characteristic descriptor	Odour type code	Odour characteristic descriptor
1	Fragrant	9	Faecal, manure, sewer
2	Household gas	10	Fishy
3	Burnt smoky	11	Diesel/car fumes
4	Herbal, green, cut grass	12	Seaweed, mangroves
5	Oily, fatty	13	Compost
6	Rotten eggs, sulfide	14	Musty, earthy, mouldy
7	Sour, body odour	15	Other
8	Meaty		

3.2 Assessor selection

As per VDI 3940, the suitability of a potential assessor is determined via a series of odour sensitivity tests with the reference odorant n-butanol.

Two suitable assessors were selected to participate in the field odour surveys.



3.3 Survey locations

The field odour survey locations were selected based on the location of the EFS relative to the nearest sensitive receptors and the prevailing wind conditions at the time of the survey.

The location of EFS and the survey locations used in the field odour surveys are presented in **Table 3-3** and shown in **Figure 2-1**.

Table 3-3: Survey locations

Survey location identification	Address	Distance from EFS site (km)
1	41A James Meehan Street, Windsor	0.6
2	2/53 James Meehan Street Windsor	0.5
3	3 Chisholm Place, Windsor	0.4
4	63 Groves Avenue South, Mulgrave	0.5
5	151-153 Mulgrave Road, Mulgrave	0.4
6	2 Railway Road South, Mulgrave	0.3

3.4 Meteorological monitoring

Local meteorological conditions were recorded during the survey period using a Kestrel 4500 Pocket Weather Tracker positioned nearby the measurement locations and the EFS on-site weather station.



4 FIELD ODOUR SURVEY

4.1 Odour Survey 1 - 19 February 2019

The field odour survey 1 was conducted on 19 February 2019 between approximately 12:30pm and 1:15pm.

The general approach of the survey was to start at a location furthest from the EFS site and to gradually work closer, mapping the extent of the detectable odours in the downwind residential area.

The survey was timed to coincide with conditions when odour effects would be detected off-site, i.e. when winds are relatively low and blow towards receptors. Several survey attempts had to be postponed due to above average air dispersion conditions developing, or winds blowing into areas that were not accessible.

4.1.1 Meteorological monitoring

Windroses from the EFS on-site weather station and Kestrel during the survey period are presented in **Figure 4-1** and **Figure 4-2** respectively.

The wind direction during the survey period predominately occurred from the southeast quadrant. The EFS weather station predominately recorded winds from the south-southeast. The Kestrel data depicts more moderate winds predominantly from the southeast and east-southeast. Note that it is expected that stronger winds would be recorded at the EFS weather station due to the 10 metre (m) high station positioned on top of a building compared to the Kestrel instrument positioned at a height of approximately 1.6m.

Ambient temperature at the survey locations ranged from approximately 30.9°C to 35.7°C.



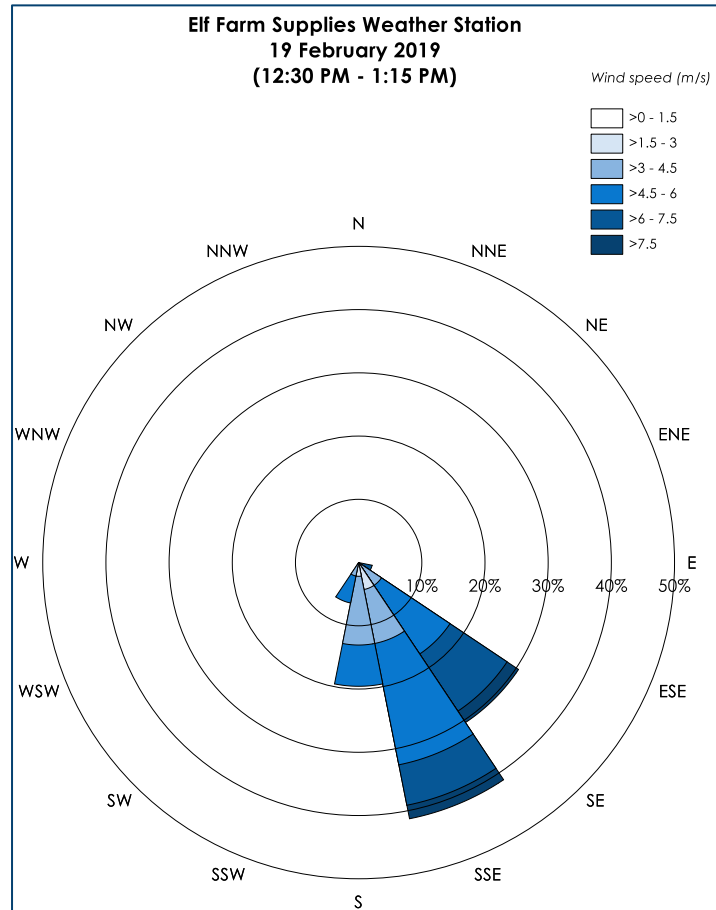


Figure 4-1: Windrose - Elf Farm Supplies, 19 February 2019, 12:30 - 1:15 PM

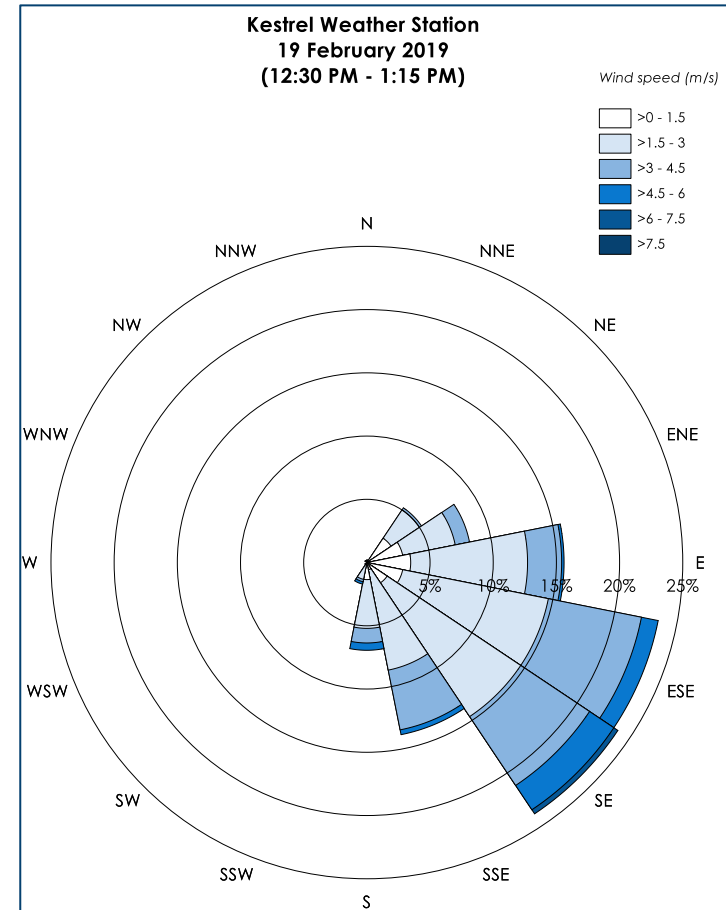


Figure 4-2: Windrose - Kestrel weather station, 19 February 2019, 12:30 PM - 1:15 PM

4.1.2 Monitoring results

A summary of the results for the field odour surveys conducted at each location is presented below.

Figure 4-3 displays the percentage of odour observations per intensity. The figure indicates that “no odour” was predominately observed at each location during the survey with the intensity of odours detected ranging from very slight to distinct.

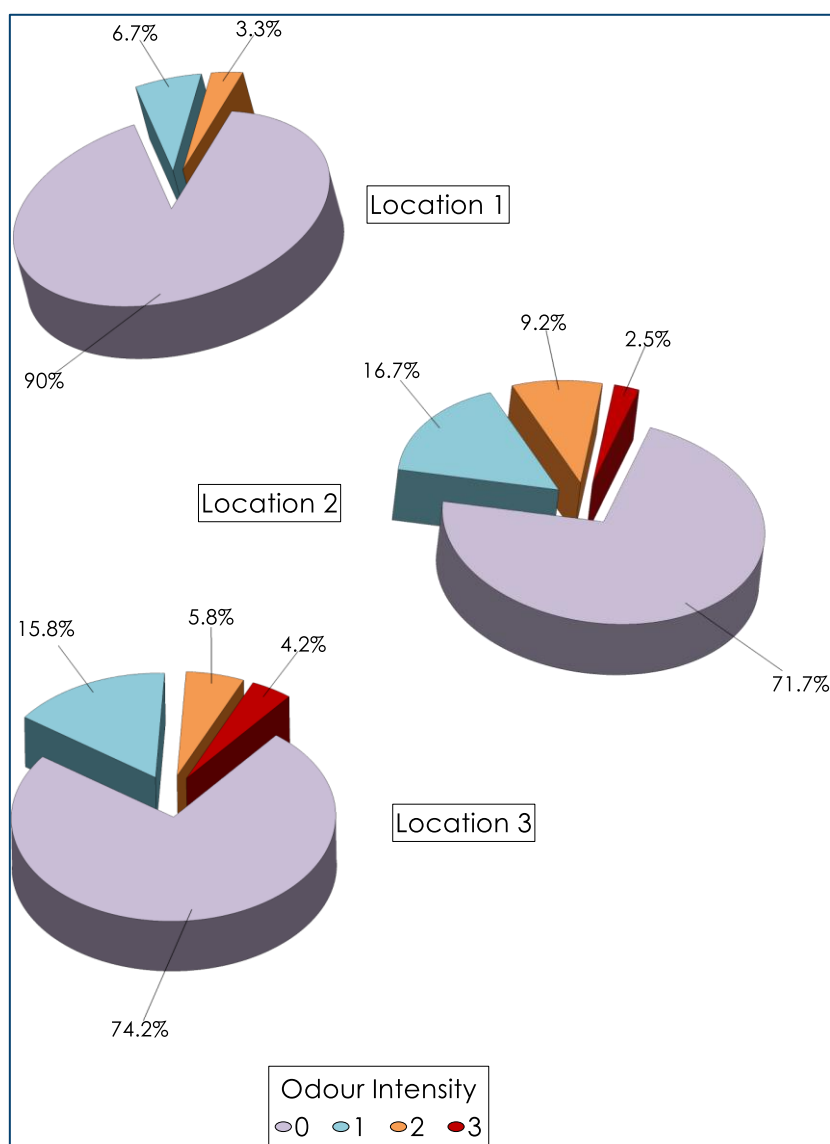


Figure 4-3: Percentage of odour observation per intensity – 19/02/2019

Table 4-1 presents the percentage of odour observations per odour characteristic and intensity identified at each survey location point.

The most common observed odour across all three location points corresponded to an odour characteristic of “faecal, manure, sewer”. Higher frequencies of this odour were observed closer towards the EFS site, with an increasing level of odour intensity.

A very slight and infrequent “musty, earthy, mouldy” odour was detected at location 3.

Other odours characterised as “grass/straw” and “chlorine” were identified at location 1 and 2 and were attributed to non-EFS sources in the immediate area.

Table 4-1: Percentage of odour observation per odour characteristic and odour intensity – 19/02/2019

Odour characteristic		Odour intensity	Location		
			1	2	3
9 - Faecal, manure, sewer		1	2.5	15.0	15.0
		2	-	9.2	5.8
		3	-	2.5	4.2
		Total	2.5	26.7	25.0
14 - Musty, earthy, mouldy		1	-	-	0.8
		2	-	-	0.8
		3	-	-	-
		Total	-	-	1.7
15 - other	Grass/ straw	1	4.2	1.7	-
		2	3.3	-	-
		3	-	-	-
		Total	7.5	1.7	-
	Chlorine	1	-	0.8	-
		2	-	-	-
		3	-	-	-
		Total	-	0.8	-

4.1.3 On-site validation

After the field odour survey was completed, the assessors went onto the EFS site in order to identify the potential on-site sources of any odours detected.

The “faecal, manure, sewer” odour characteristic recorded during the survey was characterised by one of the assessors as chicken manure. The EFS includes storage of chicken manure on-site. Upon inspection, this assessor determined the chicken manure odour on-site to have a different characteristic of more aged and dried manure odour rather than the fresh wet manure characteristic detected during the survey. The second assessor was unable to distinguish the manure smell on-site with that off-site, and considered both to be similar.

It was noted that at the time of the inspection, a doorway to the chicken manure storage shed on-site was open and that odour could have escaped and thus had the potential to be detected off-site. It is also noted that a market garden located immediately south of EFS could be a potential source of this type of odour.

The “musty, earthy, mouldy” odour was only identified with an intensity of very slight and slight and very infrequently, and thus cannot be confirmed to have originated from EFS.

The biofilter on the site has an odour characteristic of “musty, earthy, mouldy” and in terms of volume and quantity of odour released is a constant and far larger source of emissions than an open doorway to the manure storage shed, albeit with a more natural and less intrusive odour character. For trained assessors in the field, it would not be possible to detect odour from the manure storage shed without detecting far more of the “musty, earthy, mouldy” odour. As the “musty, earthy, mouldy” odour was very slight or slight and very infrequent, the EFS manure storage shed is ruled out as being the likely source of the “faecal, manure, sewer” odour detected in the residential area.

4.1.4 Discussion

The field odour survey conducted on 19 February 2019 detected very slight to distinct odours at the three survey location points.

The main odour detected during the survey was characteristic of chicken manure however it was considered that it could not have originated from the EFS site.

No odour associated with EFS was able to be identified during the survey. Some very slight and slight "musty, earthy, mouldy" odour was infrequently detected, and may possibly be related to the bio filter, but this could not be reasonably established. Regardless, this odour could not be described as offensive.



4.2 Odour Survey 2 - 8 May 2019

The field odour survey 2 was conducted on 8 May 2019 between approximately 9:30am and 10:15am.

The general approach of the survey was to start at a location furthest from the EFS site and to gradually work closer, mapping the extent of the detectable odours in the downwind residential area.

The survey was timed to coincide with the site's compost transfer operations and with meteorological conditions when odour effects would be detected off-site, i.e. when winds blow towards receptors.

4.2.1 Meteorological monitoring

A windrose from the EFS on-site weather station is presented in **Figure 4-4**. Wind speed and direction data measured by the Kestrel during the survey period were unavailable due to an equipment fault.

The wind direction during the survey period predominately occurred from the west-northwest and northwest. The EFS weather station predominantly recorded winds from the south-southeast.

Note that it is expected that stronger winds would be recorded at the EFS weather station than the Kestrel due to the 10 metre (m) high station positioned on top of a building compared to the Kestrel instrument positioned at a height of approximately 1.8m.

Ambient temperature at the survey locations ranged from approximately 16°C to 18°C.

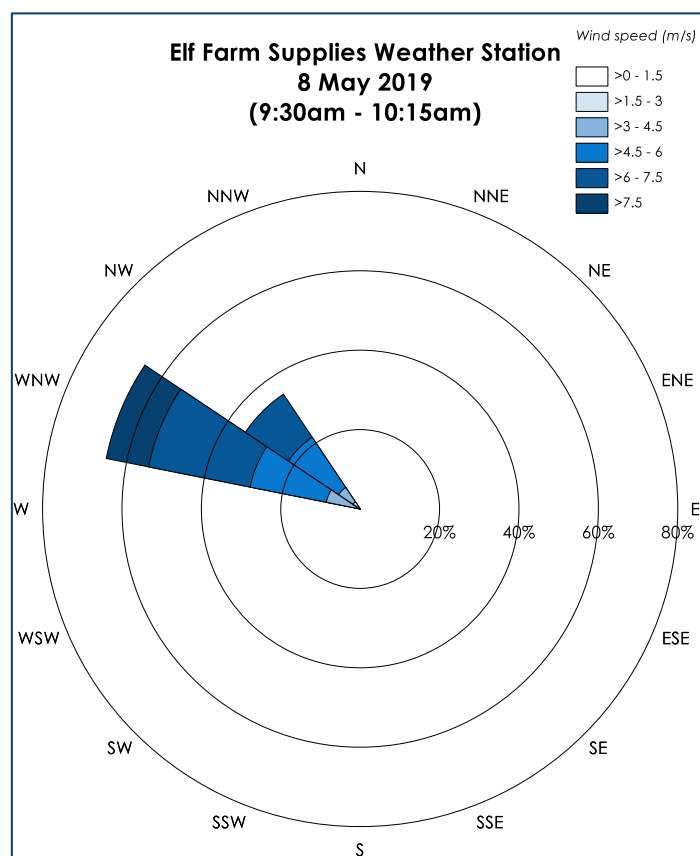


Figure 4-4: Windrose - Elf Farm Supplies, 8 May 2019, 9:30 - 10:15 AM

4.2.2 Monitoring results

A summary of the results for the field odour surveys conducted at each location is presented below.

Figure 4-5 displays the percentage of odour observations per intensity. The figure indicates that “no odour” was predominantly observed at each location during the survey with the intensity of odours detected ranging from very slight to strong. Strong odour was recorded for only one 10-second measurement period by a single assessor.

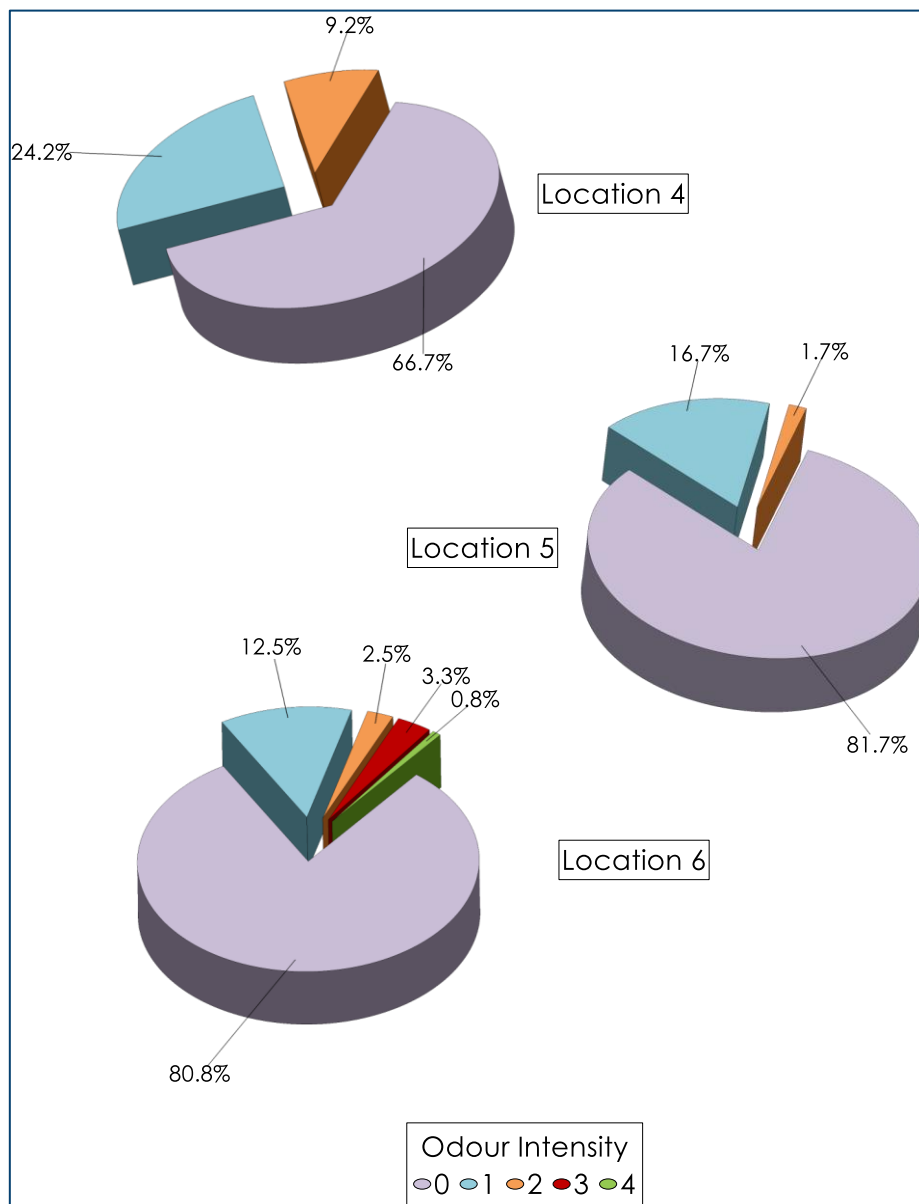


Figure 4-5: Percentage of odour observation per intensity – 8/05/2019

Table 4-2 presents the percentage of odour observations per odour characteristic and intensity identified at each survey location point.

“Faecal, manure, sewer” odours observed at location 4 were attributed to the nearby horse stabling yard.

The most common observed odour at location points 5 and 6 correspond to an odour characteristic of "compost". Higher levels of intensity of compost odours were observed closer towards the EFS site.

A very slight "burnt, smoky" odour was detected at location 4.

"Herbal, green, cut grass" odours were identified at all locations and were attributed to non-EFS sources in the immediate area.

Table 4-2: Percentage of odour observation per odour characteristic and odour intensity – 8/05/2019

Odour characteristic	Odour intensity	Location		
		4	5	6
3 – Burnt, smoky	1	0.8	0	0
	2	0	0	0
	3	0	0	0
	Total	0.8	0	0
4 – Herbal, green, cut grass	1	7.5	3.3	4.2
	2	0.8	0	0
	3	0	0	0
	Total	8.3	3.3	4.2
9 - Faecal, manure, sewer	1	15.8	0	0
	2	8.3	0	0
	3	0	0	0
	Total	24.1	0	0
13 - Compost	1	0	13.3	8.3
	2	0	1.7	2.5
	3	0	0	3.3
	4	0	0	0.8
	Total	0	15.0	14.9

4.2.3 On-site validation

After the field odour survey was completed, the assessors went onto the EFS site in order to identify the potential on-site sources of any odours detected.

The specific "compost" odour characteristic recorded during the survey was not attributed to a specific activity or source on-site (i.e. biofilter, manure shed).

It was noted that the compost transfer activities were occurring on-site during the survey period. These activities were observed during the on-site visit for the purpose of odour validation. Upon inspection, the compost transfer activities were found to have a much stronger odour with an ammonia type characteristic.

It is possible that the "compost" like odour detected off-site could have originated from the compost transfer activities being diluted, however this was unable to be confirmed or disproved.

It is noted that other sources including the market garden located adjacent to EFS, which utilises compost and manure for its operations may have contributed to the manure or compost odours detected during the survey period.

4.2.4 Discussion

The offensiveness of odour detected for each survey location on 8 May 2019 has been evaluated using the FIDOL factors (frequency, intensity, duration, odour character and location). **Table 4-3** presents a summary of the evaluation.

Table 4-3: Evaluation of odour using FIDOL factors for 8/05/2019

Location ID	Frequency	Intensity	Duration	Odour character	Location
4	24%	Very slight to slight	20 - 60 seconds	Manure - unpleasant	Located in a rural setting, zoned for "primary production"
5	15%	Very slight to slight	10 - 70 seconds	Compost - unpleasant	
6	15%	Very slight to strong	10 - 50 seconds	Compost - unpleasant	

The "manure" odour (associated with the nearby horse stabling yard) was observed to occur approximately 24% of the time at Location 4 and "compost" odour was observed to occur approximately 15% of the time at Locations 5 and 6.

The intensity of the odours detected were predominately very slight and slight with four occurrences of distinct odour and one occurrence of strong odour. The duration of odour ranged between 10 to 70 seconds.

While the predominant odour characters detected during the survey of "manure" and "compost" are generally considered unpleasant, they are not considered out of place for the particular survey locations which are situated in a rural setting in an area zoned for primary production.

For Locations 4 and 5 the odour detected were found to be infrequent and of a low intensity with a character suitable for the location and thus are not considered to be offensive. At Location 6, periods of distinct and strong odours were recorded. There was only one event during the survey when distinct and strong "compost" odours were observed. One assessor recorded a single instance of strong intensity and distinct odour occurring over a 30-second period, the other assessor recorded only a single instance of distinct odour. Overall strong "compost" odour was observed by both assessors for <1% of the time and distinct odour for 3% of the time, with the event lasting a maximum duration of 40 seconds or 7% of the survey period. Due to the low frequency and short duration this odour is not considered offensive.

4.3 Odour Survey 3 – 30 September 2019

The field odour survey 3 was conducted on 30 September 2019 between approximately 12:30pm and 1:15pm.

The general approach of the survey was to start at a location furthest from the EFS site and to gradually work closer, mapping the extent of the detectable odours in the downwind residential area.

The survey was timed to coincide with conditions when odour effects would be detected off-site at, i.e. when winds blow towards receptors. Several survey attempts had to be postponed due to winds blowing into areas that were not accessible.



4.3.1 Meteorological monitoring

Windroses from the EFS on-site weather station and Kestrel during the survey period are presented in **Figure 4-6** and **Figure 4-7** respectively.

The wind direction during the survey period predominately occurred from the southeast quadrant. The EFS weather station predominately recorded winds from the south-southeast. The Kestrel data depicts more moderate winds predominantly from the east to southeast. Note that it is expected that stronger winds would be recorded at the EFS weather station due to the 10 metre (m) high station positioned on top of a building compared to the Kestrel instrument positioned at a height of approximately 1.6m.

Ambient temperature at the survey locations ranged from approximately 16.5°C to 21.4°C.

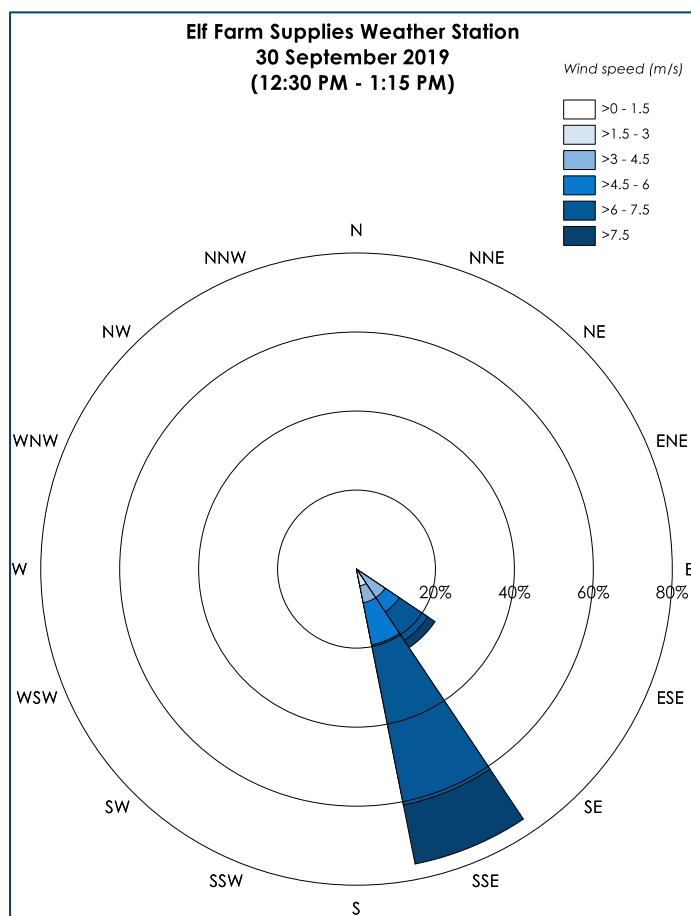


Figure 4-6: Windrose - Elf Farm Supplies, 30 September 2019, 12:30 - 1:15 PM

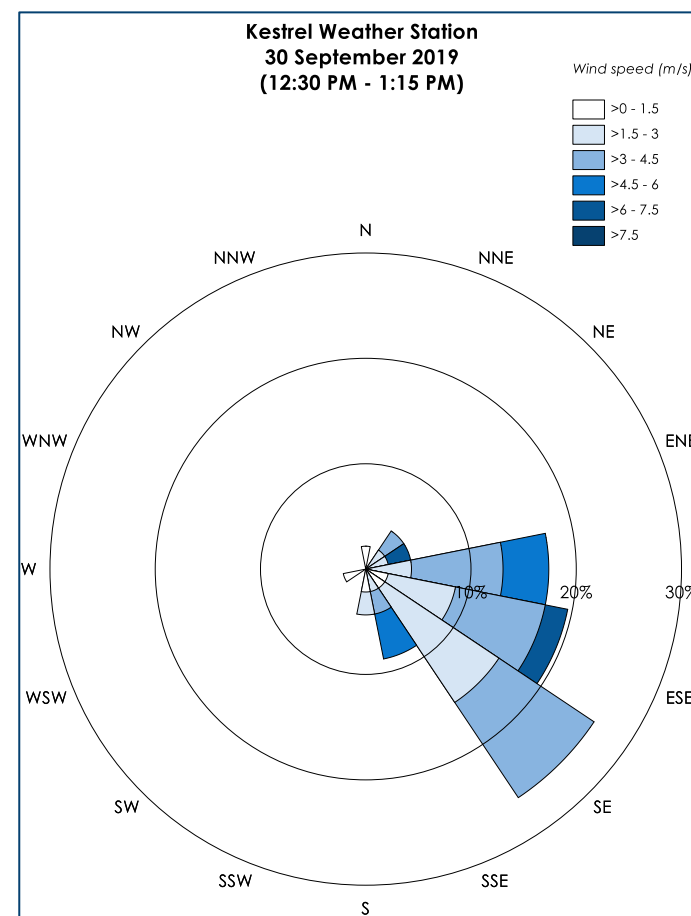


Figure 4-7: Windrose - Kestrel weather station, 30 September 2019, 12:30 PM - 1:15 PM



4.3.2 Monitoring results

A summary of the results for the field odour surveys conducted at each location is presented below.

Figure 4-8 displays the percentage of odour observations per intensity. The figure indicates that “no odour” was predominately observed at each location during the survey with the intensity of odours detected ranging from very slight to slight.

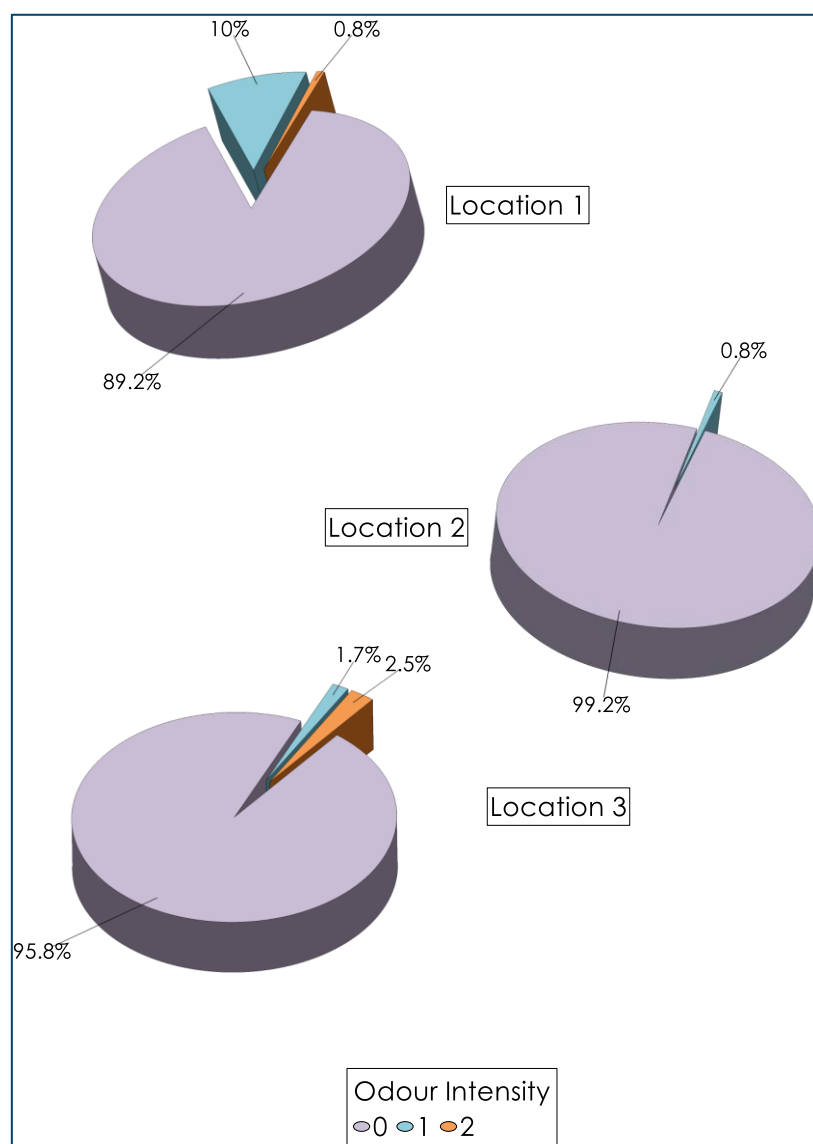


Figure 4-8: Percentage of odour observation per intensity – 30/09/2019

Table 4-4 presents the percentage of odour observations per odour characteristic and intensity identified at each survey location point.

The “herbal, green, cut grass” odours detected at location 1 were attributed to nearby lawn mowing activities.

A very slight “paint, solvent” odour was detected at location 2 and was attributed to non-EFS sources in the immediate area.

A very slight to slight "compost" odour was detected at location 3 for a period of approximately 30 seconds.

Table 4-4: Percentage of odour observation per odour characteristic and odour intensity – 30/02/2019

Odour characteristic		Odour intensity	Location		
			1	2	3
4 – Herbal, green, cut grass		1	10.0	0	0
		2	0.8	0	0
		Total	10.8	0	0
13 - Compost		1	0	0	1.7
		2	0	0	2.5
		Total	0	0	4.2
15 - Other	Paint, solvent	1	0	0.8	0
		2	0	0	0
		Total	0	0.8	0

4.3.3 On-site validation

Based on previous site inspections, the compost odour characteristic was not attributable to the biofilter (considered to have more of "musty, earthy, mouldy" character) or the manure sheds (character described as manure).

In consideration of the one-off nature and short duration of the compost odour detected off-site, it is possible that this odour could have originated from the short term emission of odour from the EFS site such as from the opening of a door way, however the proponent was unable to identify a specific activity occurring at this time that would account for this.

It is noted that other sources including the market garden located adjacent to EFS, which utilises compost for its operations may have contributed to the compost odours detected during the survey period.

4.3.4 Discussion

Some very slight and slight "compost" odours were detected at location 3 for a period of approximately 30 seconds, and may relate to the EFS site, however this odour could not be described as offensive.

The offensiveness of odour detected for survey location 3 on 30 September 2019 has been evaluated using the FIDOL factors (frequency, intensity, duration, odour character and location). **Table 4-5** presents a summary of the evaluation.

Table 4-5: Evaluation of odour using FIDOL factors for 30/09/2019

Location ID	Frequency	Intensity	Duration	Odour character	Location
3	4.2%	Very slight to slight	30 seconds	Compost - unpleasant	Located in a low density residential setting adjacent to land zoned for "light industrial" and "primary production"

A single occurrence of "compost" odour was observed. The duration of this odour was approximately 30 seconds, which equates to approximately 4.2% of the time at Location 3.

The predominant odour character detected during the survey of "compost" is generally considered unpleasant, however the intensity of the compost odours detected were only very slight and slight.

Due to the mild intensity, low frequency and short duration this odour is not considered offensive.

4.4 Odour Survey 4 – 31 March 2020

The field odour survey 4 was conducted on 31 March 2020 between approximately 6:00pm and 6:40pm. The fourth odour survey was unable to be completed in the fourth quarter of 2019 or early 2020 due to smoke from the 2019/2020 NSW bushfires.

The general approach of the survey was to start at a location furthest from the EFS site and to gradually work closer, mapping the extent of the detectable odours in the downwind residential area.

The survey was timed to coincide with the site's compost transfer operations and with meteorological conditions when odour effects would be detected off-site, i.e. when winds blow towards receptors. It is noted that the timing of the compost transfer activities for the fourth survey was in the evening and differs from the typical operations as a result of staffing changes due to the COVID-19 pandemic.

4.4.1 Meteorological monitoring

Windroses from the EFS on-site weather station and Kestrel during the survey period are presented in **Figure 4-9** and **Figure 4-10** respectively.

The wind direction during the survey period predominantly occurred from the southeast quadrant. Ambient temperature at the survey locations ranged from approximately 22.9°C to 25.8°C.



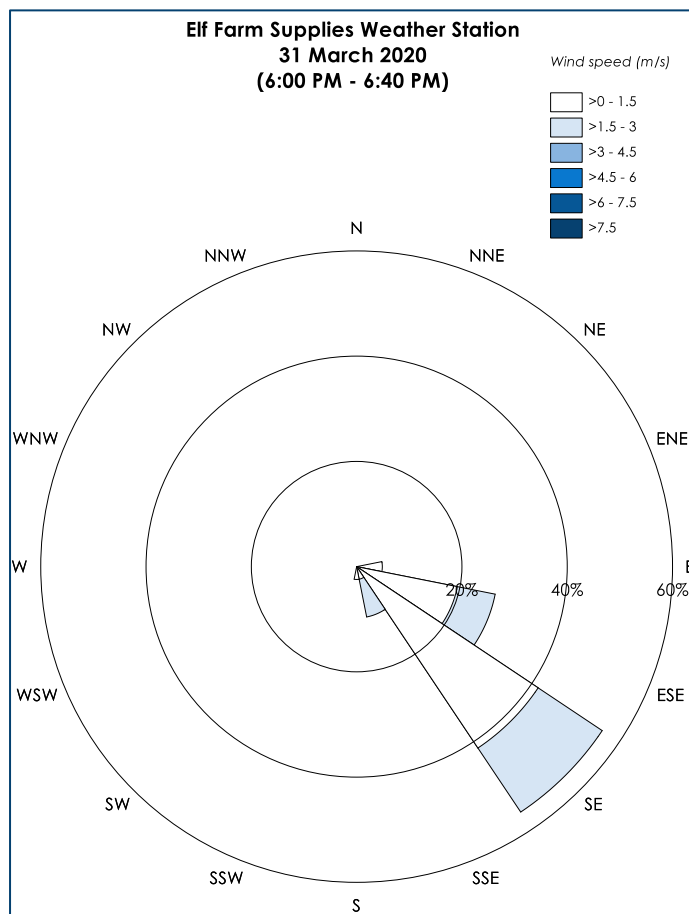


Figure 4-9: Windrose - Elf Farm Supplies, 31 March 2020, 6:00 PM – 6:40 PM

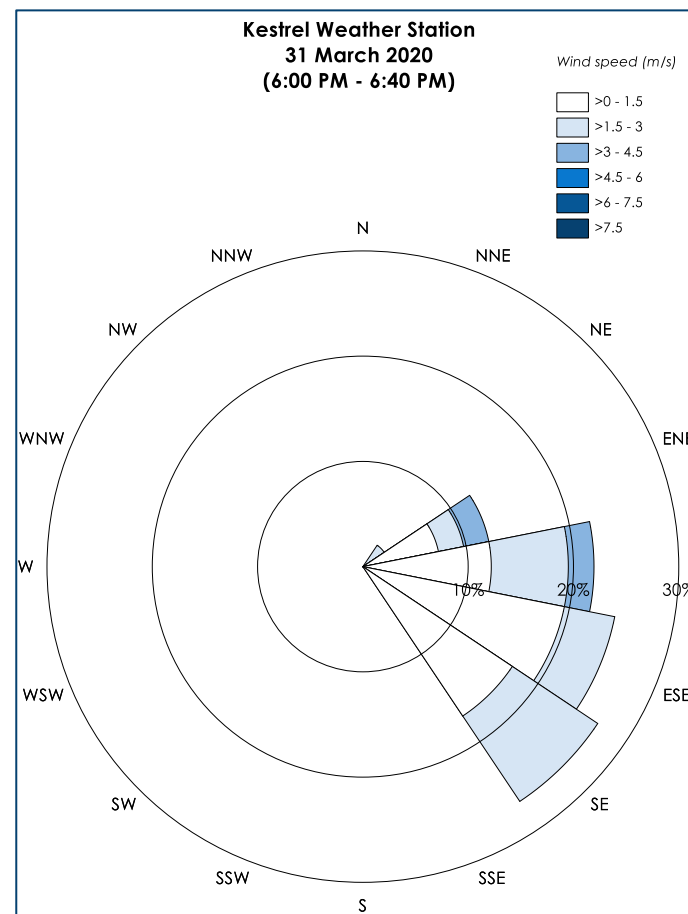


Figure 4-10: Windrose - Kestrel weather station, 31 March 2020, 6:00 PM – 6:40 PM

4.4.2 Monitoring results

A summary of the results for the field odour surveys conducted at each location is presented below.

Figure 4-11 displays the percentage of odour observations per intensity. The figure indicates that “no odour” was predominantly observed at each location during the survey with the intensity of odours detected ranging from very slight to slight.

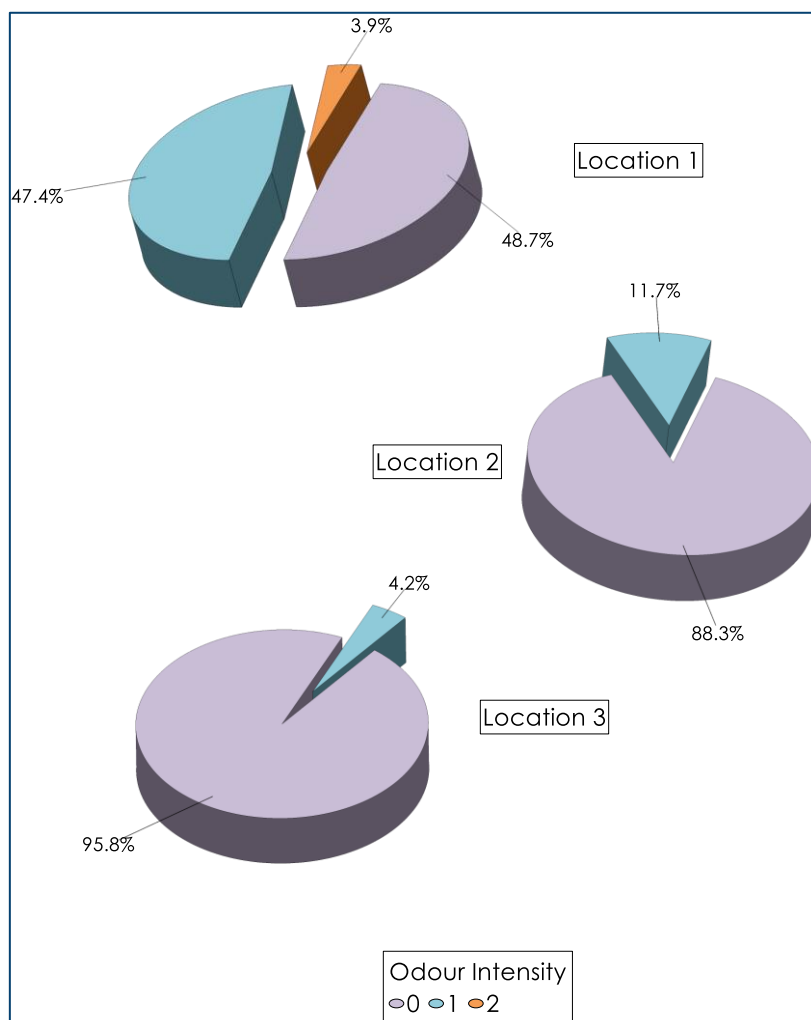


Figure 4-11: Percentage of odour observation per intensity – 31/03/2020

Table 4-6 presents the percentage of odour observations per odour characteristic and intensity identified at each survey location point.

The “herbal, green, cut grass” odours detected at location 1 were attributed to the freshly cut grass in the park area.

The “garbage” odours detected at location 2 were attributed to domestic bins out on the street for kerbside collection.

The very slight “burnt smoky”, “rotten eggs, sulphide”, “diesel/ car fumes” and “fragrant” odours detected during the survey were attributed to non-EFS sources in the immediate area. It was noted

during the survey that a number of local residents were engaging in domestic activities which may have contributed to the odours detected.

Very slight to slight "faecal, manure, sewer" odours were detected at location 1 for periods of approximately 10 to 20 seconds at a time. These odours were considered likely to be due to stagnant waters in the local creek resulting from heavy flooding in early to mid February 2020.

A very slight to slight "compost" odour was detected at location 1 for a period of approximately 80 seconds. Very slight "compost" odours were detected at location 2 for periods of approximately 10 seconds at a time.

Table 4-6: Percentage of odour observation per odour characteristic and odour intensity – 31/03/2020

Odour characteristic	Odour intensity	Location		
		1	2	3
1 – Fragrant	1	0	0	0.8
3 – Burnt smoky	1	2.3	0	0
4 – Herbal, green, cut grass	1	26.2	0.8	3.3
	2	0.8	0	0
	Total	27.0	0.8	0
6 – Rotten eggs, sulphide	1	0.8	3.3	0
9 – Faecal, manure, sewer	1	5.6	0	0
	2	0.8	0	0
	Total	6.4	0	0
11 – Diesel/ car fumes	1	2.2	0.8	0
13 – Compost	1	10.3	2.5	0
	2	2.3	0	0
	Total	12.6	2.5	0
15 – Other Garbage	1	0	4.2	0

4.4.3 On-site validation

Based on previous site inspections, the compost odour characteristic was not attributable to the biofilter (considered to have more of a "musty, earthy, mouldy" character) or the manure sheds (character described as manure).

It was noted that the compost transfer activities did not commence until approximately 6:15pm on 31 March 2020 and so any compost odours detected during the survey at location 1 (6:04pm to 6:14pm) would not have been associated with that activity. In consideration of the one-off nature and short duration of the compost odour detected at location 1, it is possible that this odour could have originated from the short term emission of odour from the EFS site such as from the opening of a doorway.

It is possible that the intermittent compost odours detected at location 2 were due to the compost transfer activities, however compost odours were not detected at location 3 which is located closest to the EFS site.

It is noted that other sources including the market garden located adjacent to EFS, which utilises compost for its operations may have contributed to the compost odours detected during the survey period.



4.4.4 Discussion

Some very slight and slight "compost" odours were detected at location 1 and 2 and may relate to the EFS site.

The offensiveness of odour detected for survey locations 1 and 2 on 31 March 2020 has been evaluated using the FIDOL factors (frequency, intensity, duration, odour character and location). **Table 4-7** presents a summary of the evaluation.

Table 4-7: Evaluation of odour using FIDOL factors for 31/03/2020

Location ID	Frequency	Intensity	Duration	Odour character	Location
1	12.6%	Very slight to slight	80 seconds	Compost - unpleasant	Located in a low density residential setting adjacent to land zoned for "light industrial" and "primary production"
2	2.5%	Very slight	3 x 10 second periods	Compost - unpleasant	Located in a low density residential setting adjacent to land zoned for "light industrial" and "primary production"

The predominant odour character detected during the survey of "compost" is generally considered unpleasant, however the intensity of the compost odours detected were only very slight and slight.

The duration of odour was approximately 80 seconds at location 1 and 10 seconds at location 2.

While the duration of odour detected at location 1 has potential to cause nuisance, overall as the odour was predominantly very slight (only just perceivable) it is not considered to be offensive.

Due to the mild intensity, low frequency and short duration of odour at location 2, this odour is not considered offensive.

5 SUMMARY AND CONCLUSIONS

Field odour surveys were conducted on 19 February 2019, 8 May 2019, 30 September 2019 and 31 March 2020.

Chicken manure odour detected during the survey on 19 February 2019 was not attributed the EFS site and the infrequent very slight and slight “musty, earthy, mouldy” odour which may be related to the biofilter is not considered offensive.

Manure odours detected during the 8 May 2019 survey were attributed to a local horse stabling yard and while compost odour was detected off-site, it was not attributed to a specific activity or source on-site. In consideration of the frequency, intensity, duration, odour character and location of odours recorded during the survey, the odour detected is considered to not be offensive.

A brief period of compost odour was detected during the 30 September 2019 survey. The source of this odour was not able to be determined. Due to the frequency, intensity and duration recorded during the survey, the compost odour detected is considered to not be offensive.

Faecal/sewer odours detected during the 31 March 2020 survey were attributed to the local creek resulting from recent heavy flooding. Compost odours detected during this survey may relate to the EFS site however were not considered to be offensive.

Overall odours characteristic of the biofilter were only detected off-site during one of the four surveys with only very slight and slight intensities and thus the biofilter is considered to be operating effectively.



6 REFERENCES

Todoroski Air Sciences (2017)

"Odour Management Plan Elf Farm Supplies Substrate Facility", prepared for Elf Farm Supplies Pty Ltd by Todoroski Air Sciences, December 2017

VDI 3940 (1993)

"Verein Deutscher Ingenieure (VDI) 3940: Determination of Odorants in Ambient Air by Field Inspections", October 1993