



memorandum

TO Christchurch City Council FROM [REDACTED]
DATE 28/03/2023
RE Living Earth Odour Monitoring: 27th February 2023 to 12th March 2023 Summary

1.0 Background

Living Earth Limited (Living Earth) operates an organics processing plant and composting facility located at 40 Metro Place, Bromley, Christchurch (the LE Site). Living Earth's air discharges are subject to the conditions attached to air discharge consent CRC080301.1 ("the consent") from Canterbury Regional Council (CRC) to discharge contaminants (odour and dust) to air.

Specifically, Condition 27 of the consent states that:

"The discharges of air shall not cause odour or dust which is offensive or objectionable beyond the boundary of the site on which this consent is exercised."

While Living Earth operates the composting facility, Christchurch City Council (CCC) holds the consent.

Pattle Delamore Partners Limited (PDP) has been providing assistance to CCC and Living Earth regarding the assessment and management of odour effects from the site. This has included regular odour scouting. The objectives of the odour scouting are to:

- ✧ Correlate the intensity and characters of observed odour (where possible) to:
 - Odour sources in the Bromley area.
 - Specific activities and/or sources on the LE Site.
 - Meteorological conditions.
 - Time of day.
- ✧ Undertake FIDOL assessments to determine if offensive or objectionable odours are present beyond the site boundary.
- ✧ Corroborate the content of community (i.e., Smelt-It) complaints.

This letter provides a summary of PDP's observations of off-site odour scouting of the period between the 27th February 2023 and the 12th March 2023.

2.0 Summary of Methodology

Odour observations are made by PDP odour scouts. To ensure consistency between scouts, PDP ensures the following:

1. Scouts periodically undertake parallel odour assessments with each other in the field.

2. Scouts periodically visit the LE Site and familiarise themselves with the character of the odour from the various onsite sources.
3. Scouts undergo nose calibration via direct dilution olfactometry according to the requirements of AS/NZS 4323.3:2001 Section 9.7.2.

During an assessment, scouts walk at a comfortable pace through the area downwind of the LE Site, making note of odours detected. PDP has defined a series of observation points in the area where the scout makes more detailed observations, shown in **Figure 1**. The exact route and observation points visited in an assessment depend on the meteorological conditions (wind speed and direction) and the odour (if any) detected by the scout on the route.

Sites H and M are immediately downwind of the site, located along Dyers Road with sites G and F. Sites I, J, K, and N are located in the heavy industrial zone. Sites A, C, B, D, and P are located in the residential zone around Bayswater Reserve. Sites E, L, O and Q are located roughly along the residential-industrial boundary. In assessments, Sites E, O, and Q are used to represent the closest (to the LE Site) downwind edge of the residential zone. Site L is located in the general industrial zone - Site D is used as the closest (to the LE Site) downwind residential monitoring point in this area.



Figure 1: Odour Observation Locations

In key areas where odour is detected, or at known sensitive areas, a full 10-minute odour observation is taken. Where 10-minute observations are taken at a site, a FIDOL assessment is completed by the scout and a determination made as to whether the odour is offensive or objectionable.

Determinations made are necessarily the opinion of the odour scout at that time to the conditions they encounter. They are based upon observations in the field but may also include consideration of wider factors such as meteorological conditions and patterns of site activity when considering the potential for offensive or objectionable odour over longer time periods.

Each scout makes their determination with reference to other determinations made, both within PDP, and more widely amongst the air quality profession.

Summaries for each odour scout are included in Section 3.0. Detailed analysis of specific observations is included, where necessary. Results of all 10-minute odour observations, summarised by observation location, are appended to this memorandum.

This memorandum presents the results of the odour scouting undertaken. This report does not analyse odour trends across time.

2.1 FIDOL Analysis

As per Ministry for the Environment's Good Practice Guide for Assessing and Managing Odour (MfE GPG), odours were assessed against the FIDOL factors to determine if they are offensive or objectionable. The FIDOL factors are:

- ∴ Frequency;
- ∴ Intensity;
- ∴ Duration;
- ∴ Offensiveness/Character¹; and
- ∴ Location.

Odour intensity is reported on a scale of (0-6) as per the MfE's GPG Odour. PDP applies the following descriptions to each odour intensity to ensure consistency between scouts:

0. No Odour: No odour.
1. Very Weak: Odour detectable but character not recognisable.
2. Weak: Odour detectable and barely recognisable.
3. Distinct: Odour readily recognisable.
4. Strong: Odour is strong but not causing discomfort to assessor.
5. Very Strong: The odour causes some discomfort; assessor can remain in area but will consider leaving/altering breathing patterns.
6. Extremely Strong: The odour causes assessor to feel nauseous or compelled to leave the area.

When determining whether odour is having an offensive or objectionable effect, odour scouts make their determination with respect to the FIDOL factors. No regulatory standard exists for the specific combination of FIDOL factors that do or do not constitute an offensive or objectionable odour. However, as a broad litmus test when making determinations at the Living Earth site, PDP scouts consider

¹ "It is preferable to refer to the character of an odour, rather than its 'offensiveness' to avoid confusion between the inherent characteristics of an odour (i.e., whether it is pleasant or unpleasant) and whether there is an 'objectionable or offensive' effect occurring as a result of exposure to odour." (MfE GPG Odour)

intermittently distinct (3) or continuous weak (2) odours of a negative hedonic tone (such as compost) to be offensive or objectionable in a residential zone.

Within a heavy industrial zone, there is a lower expectation of amenity as it pertains to odour.

Based on PDP's understanding, this approach is generally consistent with that used by other air quality professionals.

3.0 Results Summary

Result summaries for each odour scout are reported below. Results of all 10-minute odour observations, summarised by observation location, are appended to this memorandum.

Scouts were present in the Bromley area on the:

- ∴ 1st March 2023;
- ∴ 6th March 2023;
- ∴ 7th March 2023; and,
- ∴ 9th March 2023.

3.1 1st March 2023

The weather was clear, with a temperature of 18 °C and an easterly wind ranging from 6.7 m/s to 7.3 m/s as a 10-minute average. [REDACTED] was the PDP odour scout. The scout started at Site L (Woburn Street) and finished at Bromley Road. Broadly, the object was to collect a full cross-section of the area downwind of the LE Site. The odour scout route (lime green dots) and key scouting locations are shown in **Figure 2**.



Figure 2: 1st March 2023 - Odour Scout Route

Results from the odour scout are shown below. Entries within Table 1 that are highlighted blue denote locations within a residential zone and purple denotes locations within an industrial zone.

Table 1: 1st March 2023 - Odour Scouting Summary

Site	Time	Observations
L	16:51	No odour detected.
L to E		No odour detected.
E		Weak (2) marine odour with a positive to neutral hedonic tone detected.
E to F		No odour detected.
G	17:01	FIDOL assessment completed. Very weak (1) odours of an indeterminate character were present 3% of the time. Weak (2) compost odour was present 33% of the time. Distinct (3) compost odour was present 63% of the time. Odour assessed as not offensive or objectionable.
G to H		Weak (2) to distinct (3) compost odour detected.

Table 1: 1st March 2023 - Odour Scouting Summary

Site	Time	Observations
H	17:12	FIDOL assessment completed. Very weak (1) odours of an indeterminate character were present 47% of the time. Weak (2) compost odour was present 48% of the time. Weak (2) rubbish odour was present 2% of the time. Weak (2) cigarette smoke odour was present 2% of the time. Distinct (3) compost odour was present 2% of the time. Odour assessed as not offensive or objectionable.
H to I		No odour (0) to weak compost odour (2) detected.
I	17:29	FIDOL assessment completed. No odour was present 32% of the time. Very weak (1) odours of an indeterminate character were present 28% of the time. Weak (2) compost odour was present 37% of the time. Distinct (3) compost odour was present 3% of the time. Odour assessed as not offensive or objectionable.
I to N		Localised distinct (3) solvent odour detected.
N to I		Localised distinct (3) solvent odour detected.
I to J		No odour (0) to weak compost odour (2) detected.
J to K		No odour (0) to weak compost odour (2) detected.
K	17:43	FIDOL assessment completed. No odour was present 2% of the time. Very weak (1) odours of an indeterminate character were present 32% of the time. Weak (2) compost odour was present 20% of the time. Weak (2) odour of a negative hedonic tone resembling soil or manure was present 45% of the time. Distinct (3) odour of a negative hedonic tone resembling soil or manure was present 2% of the time. Odour assessed as not offensive or objectionable.
K to L		No odour (0) to weak compost odour (2) detected.
L to D		No odour detected.
D to Q		No odour (0) to weak compost odour (2) detected.
Q	18:02	FIDOL assessment completed. No odour was present 78% of the time. Very weak (1) odours of an indeterminate character were present 8% of the time. Weak (2) compost odour was present 13% of the time. Odour assessed as not offensive or objectionable.

Except for Site Q, compost odour was not detected in the residential zone. Intermittent, weak (2) compost odour was detected at Site Q. This intermittent odour was not offensive or objectionable.

Distinct (3) compost odour was detected through the industrial zone, typically with a frequency below 10%. The highest frequency of distinct (3) compost odour was found at Site G. Being in a heavy industrial zone, this odour was not offensive or objectionable for the location.

At Site K, the weak (2) to distinct (3) soil/manure smell encountered was unfamiliar to the scout and did not match the character of odours observed from the LE site previously. It was not observed along Dyers Rd or at Site N so may reflect another odour source in the industrial zone.

The character of the compost odour matched PDP's experience with the odour generated by the outdoor material, namely the unscreened compost, oversize stockpiles and screened fines. The odour did not match PDP's experience with the odour from the processing hall or associated biofilter.

On the 1st March 2023, Environment Canterbury (ECan) issued a Notice of Non-Compliance (NONC) to Waste Management, citing:

"Odour observed in residential area downwind of site."

The NONC was issued at 12:41 on the 1st March 2023. The NONC stated that the purpose of the inspection was in response to a complaint.

Additional detail about the day of the NONC is included below.

3.2 1st March 2023 NONC - Additional Analysis

3.2.1 Site Activities on the 1st March 2023

An operational summary of the site during the period when ECan were investigating the odour is:

- ∴ Fines were being removed from the site;
- ∴ Hire screen 1 (outdoor screen) was operating;
- ∴ The main screen was being cleaned;
- ∴ Trucks were depositing kerbside organics (KSO) in the OPP processing hall; and
- ∴ Maintenance was being done on the large biofilter (which treats the OPP air). The biofilter fan was off.

PDP were present in Bromley later in the day (approximately 16:50 to 18:15). An operational summary of the site during the period when PDP were undertaking proactive odour scouting is:

- ∴ Fines were being removed from the site (no change from earlier);
- ∴ Hire screen 1 (outdoor screen) was operating (no change from earlier);
- ∴ The main screen was being cleaned (no change from earlier); and
- ∴ Exposed areas of the biofilter had been covered with tarpaulins and the biofilter fan restarted since 15:00.

Living Earth have provided a summary of the work involved with the biofilter maintenance:

- ∴ When the biofilter fan is off, air is circulated through the tunnels by the tunnel fans and the small OPP axial extraction fan is still running. Water vapour builds up in the OPP;
- ∴ OPP extraction is very low (the axial fan cannot maintain the OPP at negative pressure). Doors are kept closed where practical; and
- ∴ The biofilter fan is switched on and off during the day to facilitate different activities during the biofilter repair process. At the time of the ECan visit the fan was off as work was occurring in the vents of the biofilter.

To summarise, during PDP’s odour scout, site activities were similar to the window when ECan were present, with the exception of the activities occurring around the biofilter maintenance.

3.2.2 Meteorology on the 1st March 2023

The meteorology, as measured at NIWA’s Bromley EWS (on a 10-minute basis) for the day of the 1st March 2023 is presented in **Figure 3**.

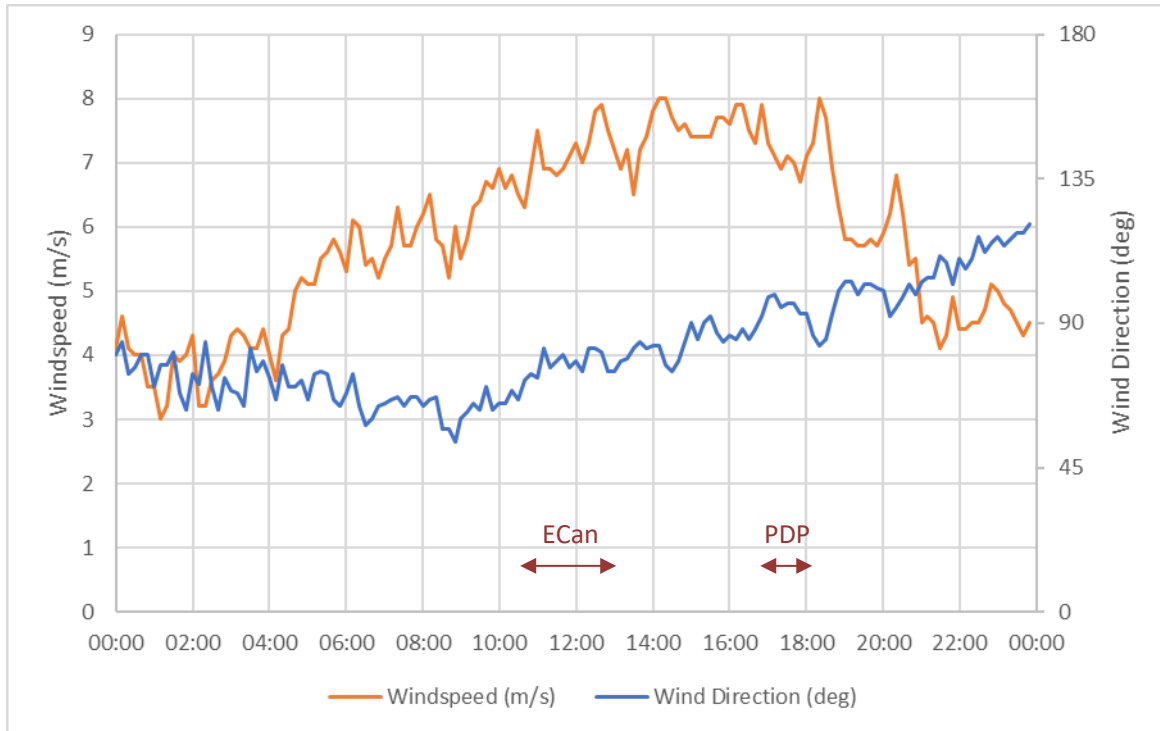


Figure 3: 1st March 2023 - Bromley EWS Meteorology

Windspeeds were fairly consistent over the course of the day:

- ∴ Ranging between 5.5 m/s and 8 m/s during daylight hours, and
- ∴ Approximately 4 m/s in the early morning and late evening.

The wind started from an ENE direction (approx. 70°) and gradually shifted towards ESE over the course of the day.

While ECan were present in the Bromley area, conditions were approx. 7 m/s ENE winds.

While PDP were present in the Bromley area, conditions were approx. 7.5 m/s E winds.

3.2.1 Discussion of the 1st March 2023

Several sources of information are available when reviewing odours in Bromley on the 1st of March, these include:

- ∴ Two odour complaint investigation forms completed by ECan compliance officers, and the subsequently issued NONC;
- ∴ Site operational summaries provided by Living Earth;
- ∴ Proactive odour scouting from PDP staff;
- ∴ Smelt-It reports; and

- ∴ Meteorological data from NIWA's Bromley EWS.

The odour complaint investigation forms identified a range of weak (2) and distinct (3) industrial and compost odours at Woburn St at approx. 10:30.

Four Smelt-It reports, between 09:30 and 15:00 reported compost odours in the Bromley area.

A range of activities were occurring at the LE site including:

- ∴ Routine operations such as maintenance of the main screen and loadout of fines; and,
- ∴ Non-routine operations such as outdoor screening and maintenance of the biofilter.

During biofilter maintenance the biofilter fan would have been switched on and off periodically, with potential for fugitive odours from the tunnels and processing hall. The biofilter fan was running continually by 15:00.

PDP odour scouting identified:

- ∴ Distinct compost odours up to 550 metres from the LE site within the industrial zone (as measured from the main screen);
- ∴ No distinct compost odours in the residential zone; and
- ∴ Intermittent weak (2) compost odour (not offensive or objectionable) in the residential zone at Bromley Rd.

The meteorology on the day (during the period of the complaints) was 7 to 8 m/s. During the period ECan were onsite, wind directions were ENE. During the period PDP were onsite, wind directions were E.

The shift in wind direction from ENE to E will have pushed the odour plume through the industrial area when PDP were on-site as opposed as towards Woburn St when ECan were present.

PDP observed intermittent distinct (3) compost odour (that might be offensive or objectionable in a residential zone) out to 550 metres downwind² in the industrial zone. Bromley Rd is 1,090 metres from the site; PDP observed an infrequent weak (2) compost odour at that location. Woburn St is 920 metres from the site; if the wind direction was instead towards Woburn St, the odour levels would be expected to be similar to the odour levels observed at Bromley Rd.

Therefore, the variance between ECan's observations and PDP's observations are unlikely to be solely the result of changing wind directions. Other causes include:

1. A difference in how PDP and ECan classify odour intensity; and,
2. The change in the stage of the biofilter maintenance (i.e., uncovered with intermittent fan operation vs covered with fans working normally).

ECan staff appear to classify odour intensity differently than PDP when making field observations. Where ECan have recorded an odour character in their observations, the odour must be at least a weak (2) odour under PDP's classification scheme (as the character can be recognised). Therefore, based on the frequency of reported odour characters in the ECan complaint investigation forms, the odour frequency reported by ECan at Woburn St was higher than observed by PDP at Bromley Rd.

The other cause is the potential for the strength of the odour discharge to have changed over the day. Considering the work on the biofilter that was occurring, it is likely that odour discharges from the site were varied over the course of the day.

² Using the main screen as a fixed reference to measure distances from the LE site.

ECan compliance officers note on several occasions a sweet descriptor to the compost odour, which could imply an element of biofilter³ odour in the odour detected offsite.

To summarise:

- ∴ PDP were not present during the window when the NONC was issued.
- ∴ PDP were present later in the day, by which time site activities had changed and the wind direction has shifted to an easterly.
- ∴ During the period PDP were present, odours in the residential zone and industrial zone (where detected) were not offensive or objectionable.
- ∴ During the period PDP were present, odours in the industrial zone that might have been considered offensive or objectionable in a residential zone were limited to within 550 metres of the LE site.
- ∴ ECan's observation of offensive or objectionable odour occurred approximately 920 metres downwind of the LE site at an earlier time.
- ∴ A range of industrial and compost odours were detected by the ECan compliance officers in the residential zone which they deemed offensive or objectionable.
- ∴ ECan may be applying the odour intensity scale different to PDP, as such PDP cannot directly review the robustness of their conclusions based upon their recorded odour intensities.
- ∴ The maintenance of the biofilter may have been a contributing factor (not the only source) to odour off-site and may explain the difference in odour experienced by the PDP scout and the ECan compliance officers.

3.3 6th March 2023

██████████ was the PDP odour scout. The scout was present for approximately 1 hour. The temperature was 17 °C with windspeeds ranging from 4.9 m/s to 5.7 m/s as a 10-minute average from an ENE direction. The scout started and finished at Site A. Broadly, the scout worked a loop through the residential and industrial zones. The odour scout route (purple dots) and key scouting locations are shown in **Figure 4**.

³ The biofilter has a sweet odour at times.



Figure 4: 6th March 2023 - Odour Scout Route

Results from the odour scout are shown below. Entries within **Table 2** that are highlighted blue denote locations within a residential zone and purple denotes locations within an industrial zone.

Table 2: 6th March 2023 - Odour Scouting Summary

Site	Time	Observations
Site A	16:02	No odour detected.
A to C		Intermittent, very weak (1) odours of an indeterminate character were detected.
Site C	16:05	No compost odour detected. Intermittent, weak (2) floral odour detected.
Site B	16:07	No compost odour detected. Consistent, weak (2) cut grass odour detected.
Site D	16:09	No odour detected.
D to P	16:10	Very intermittent, weak (2) compost odour detected.
Site P	16:12	FIDOL assessment completed. No odour was present 83% of the time. Very weak (1) odours of an indeterminate character were present 3% of the time. Weak (2) compost odour was present 3% of the time. Weak (2) odours of baked bread and cut grass with positive hedonic tones were cumulatively present 10% of the time. Odour assessed as not offensive or objectionable.

Table 2: 6th March 2023 - Odour Scouting Summary

Site	Time	Observations
Site E	16:26	FIDOL assessment completed. No odour was present 60% of the time. Very weak (1) odours of an indeterminate character were present 27% of the time. A weak (2) marine odour with a positive hedonic tone was present 7% of the time. Weak (2) odours of diesel fumes and solvent with negative hedonic tones were cumulatively present 7% of the time. Odour assessed as not offensive or objectionable.
E to F	16:37	Continuous weak (2) cattle/manure odour detected. Intermittent, weak (2) compost odour detected.
Site F	16:40	First detection of a distinct (3) compost odour detected.
Site G	16:42	Consistent, distinct (3) compost odour detected.
Site H	16:43	Consistent, distinct (3) compost odour detected.
H to I		Consistent, weak (2) to distinct (3) compost odour detected.
Site I	16:45	Consistent, weak (2) to distinct (3) compost odour detected.
I to J		Intermittent, weak (2) compost odour detected.
Site J	16:48	Intermittent, weak (2) compost odour detected.
J to K		Intermittent, weak (2) compost odour detected.
Site K	16:52	Intermittent, weak (2) compost odour detected.
K to L (Tanya St)		Intermittent, weak (2) to distinct (3) compost odour detected.
K to L (Newton St)		Intermittent, weak (2) compost odour detected.
Site L	16:57	No odour detected.
Site D	16:59	No odour detected.
Site O	17:01	No compost odour detected. Intermittent, very weak (1) odours of an indeterminate character were detected (possibly weak (2) solvent but not confident of the character).
Site Q	17:03	No compost odour detected. Odour(s) associated with roadworks present.
Q to O	17:05	No compost odour detected. Intermittent, weak (2) sweet odour detected.
Site O	17:06	No odour detected.
O to A		No compost odour detected. Intermittent, weak (2) odour from green bins.
Site A	17:10	No odour detected.

Consistent compost odours were detected close to the LE site. Compost odours were not detected in the residential zone, with the exception of a brief period of very intermittent, weak (2) compost odours on Bayswater Crescent (Site P). Odour assessed as not offensive or objectionable.

Sites F, G, and H, along Dyers Rd, are within the heavy industrial zone. Odours that would meet the threshold of offensive or objectionable odour in a residential zone are not necessarily offensive or objectionable in the industrial area.

The character of the compost odour matched PDP’s experience with the odour generated by the outdoor material, namely the unscreened compost, oversize stockpiles and screened fines. The odour did not match PDP’s experience with the odour from the processing hall or associated biofilter.

3.4 7th March 2023

██████████ was the PDP odour scout. The scout was present for approximately two hours. The temperature was 18 °C with windspeeds ranging from 5.4 m/s to 6.7 m/s as a 10-minute average. The wind was predominately coming from an N direction. The scout started and finished at Site O, walking loops through the residential and industrial zones. The odour scout route (green dots) and key scouting locations are shown in **Figure 5**.



Figure 5: 7th March 2023 - Odour Scout Route

Results from the odour scout are shown below. Entries within Table 3 that are highlighted blue denote locations within a residential zone and purple denotes locations within an industrial zone.

Table 3: 7th March 2023 - Odour Scouting Summary

Site	Time	Observations
O	14:27	FIDOL assessment completed. No odour was present 62% of the time. Very weak (1) odours of an indeterminate character were present 18% of the time. Weak (2) compost odour was present 20% of the time. Odour assessed as not offensive or objectionable.
O to C	14:37	No odour (0) to weak compost odour (2) detected.
C	14:39	FIDOL assessment completed. No odour was present 70% of the time. Very weak (1) odours of an indeterminate character were present 12% of the time. Weak (2) compost odour was present 18% of the time. Odour assessed as not offensive or objectionable.
C to A	14:49	No odour detected.
A	14:52	FIDOL assessment completed. No odour was present 75% of the time. Very weak (1) odours of an indeterminate character were present 25% of the time. Odour assessed as not offensive or objectionable.
A to P	15:02	No odour detected.
P	15:11	FIDOL assessment completed. No odour was present 87% of the time. Very weak (1) odours of an indeterminate character were present 5% of the time. Weak (2) compost odour was present 8% of the time. Odour assessed as not offensive or objectionable.
P to B	15:21	No odour (0) to weak compost odour (2) detected.
B	15:23	FIDOL assessment completed. No odour was present 80% of the time. Very weak (1) odours of an indeterminate character were present 7% of the time. A weak (2) sweet, sugary odour with a positive hedonic tone was present 13% of the time. Odour assessed as not offensive or objectionable.
B to D	15:33	No odour (0) to very weak indeterminate odour (1) detected.
D	15:35	FIDOL assessment completed. No odour was present 43% of the time. Very weak (1) odours of an indeterminate character were present 52% of the time. Weak (2) compost odour was present 5% of the time. Odour assessed as not offensive or objectionable.
D to E	15:45	No odour (0) to very weak indeterminate odour (1) detected.
E to F	15:48	No odour (0) to weak compost odour (2) detected.
F	15:51	Distinct (3) compost odour detected.
F to G	15:52	Distinct (3) compost odour detected.
G	15:55	Distinct (3) compost odour detected.
G to H	15:55	Very weak (1) indeterminate odour to distinct (3) compost odour detected.

Table 3: 7th March 2023 - Odour Scouting Summary

Site	Time	Observations
H	15:58	Very weak (1) indeterminate odour to weak (2) compost odour detected.
H to J	15:59	No odour (0) to weak compost odour (2) detected.
J	16:06	Weak compost odour (2) detected.
J to K	16:06	No odour (0) to weak compost odour (2) detected.
K	16:10	No odour (0) detected.
K to L	16:17	No odour (0) to very weak indeterminate odour (1) detected.

Intermittent, weak (2) compost odours were detected in the residential zone, broadly along St Johns St. The odour detected was not offensive or objectionable.

Distinct (3) compost odours were detected in the industrial zone, broadly along Dyers Rd (close to the downwind boundary of the LE Site). The odour detected was not offensive or objectionable.

The character of the compost odour matched PDP's experience with the odour generated by the outdoor material, namely the unscreened compost, oversize stockpiles and screened fines. The odour did not match PDP's experience with the odour from the processing hall or associated biofilter.

3.6 9th March 2023

██████████ was the PDP odour scout. The scout was present for approximately one hour. The temperature was 24 °C with windspeeds ranging from 2.1 m/s to 4.7 m/s as a 10-minute average from an N to NW direction. Prior to attending the site, the forecast was for NNE conditions. Ground conditions on the afternoon were from a more W direction than expected. The scout completed a loop through the industrial and residential areas, confirming the lack of compost odour in the area. The odour scout route (green dots) and key scouting locations are shown in **Figure 6**.



Figure 6: 9th March 2023 - Odour Scout Route

Results from the odour scout are shown below. Entries within Table 4 that are highlighted blue denote locations within a residential zone and purple denotes locations within an industrial zone.

Table 4: 9 th March 2023 - Odour Scouting Summary		
Site	Time	Observations
D to L	14:01	No odour detected.
L to E	14:02	No odour detected.
E to P	14:06	No odour detected.
P to D	14:10	No odour detected.

Table 4: 9th March 2023 - Odour Scouting Summary

Site	Time	Observations
D to L	14:15	No odour detected.
L to K	14:17	Intermittent, very weak (1) odours of an indeterminate character were detected.
K to J	14:22	No odour detected.
J to I	14:26	Intermittent, very weak (1) odours of an indeterminate character were detected.
I to N	14:31	Distinct (3) localised solvent odour detected.
N to I	14:32	Distinct (3) localised solvent odour detected.
I to H	14:33	No odour detected.
H to G	14:35	No odour detected.
G to F	14:37	No odour detected.
F to E	14:39	No odour detected.
E to L	14:44	No odour detected.
L to Q	14:46	No odour detected.
Q	14:51	No odour detected.

No compost odours were detected during the scout. This was due to the wind conditions having a NW component instead of the forecast NE direction. No 10-minute observations were taken.

4.0 Summary

PDP undertook odour scouting on six occasions between the 27th February 2023 and the 12th March 2023. Plots of the raw results from each 10-minute assessment, summarised by monitoring location are appended to this memorandum.

Typically, PDP considers that intermittent distinct (3) or continuous weak (2) odours of a negative hedonic tone (such as compost) are offensive or objectionable in a residential zone.

Based on PDP's observations:

∴ 1st March 2023:

PDP does not consider the odour detected during the scout was offensive or objectionable.

At Site K, the weak (2) to distinct (3) soil/manure smell encountered was unfamiliar to the scout and did not match the character of odours observed from the LE site previously.

∴ 6th March 2023:

Compost odours were not detected in the residential zone, with the exception of a brief period of weak (2) compost odours on Bayswater Crescent.

PDP does not consider the odour detected during the scout was offensive or objectionable.

∴ 7th March 2023:

Intermittent, weak (2) compost odours were detected in the residential zone, broadly along St Johns St.

PDP does not consider the odour detected during the scout was offensive or objectionable.

∴ 9th March 2023:

No odour detected due to westerly wind direction.

5.0 Limitations

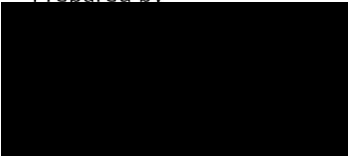
The character of the compost odour matched PDP's experience with the odour generated by the outdoor material, namely the unscreened compost, oversize stockpiles and screened fines. The odour did not match PDP's experience with the odour from the processing hall or associated biofilter.

This memorandum has been prepared by Pattle Delamore Partners Limited (PDP) on the basis of information provided by Christchurch City Council and Living Earth. PDP has not independently verified the provided information and has relied upon it being accurate and sufficient for use by PDP in preparing the memorandum. PDP accepts no responsibility for errors or omissions in, or the currency or sufficiency of, the provided information.

This memorandum has been prepared by PDP on the specific instructions of Christchurch City Council for the limited purposes described in the memorandum. PDP accepts no liability if the memorandum is used for a different purpose or if it is used or relied on by any other person. Any such use or reliance will be solely at their own risk.

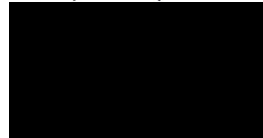
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Prepared by



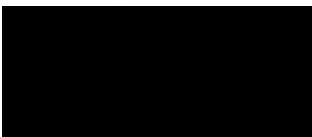
Senior Environmental Engineer

Prepared by



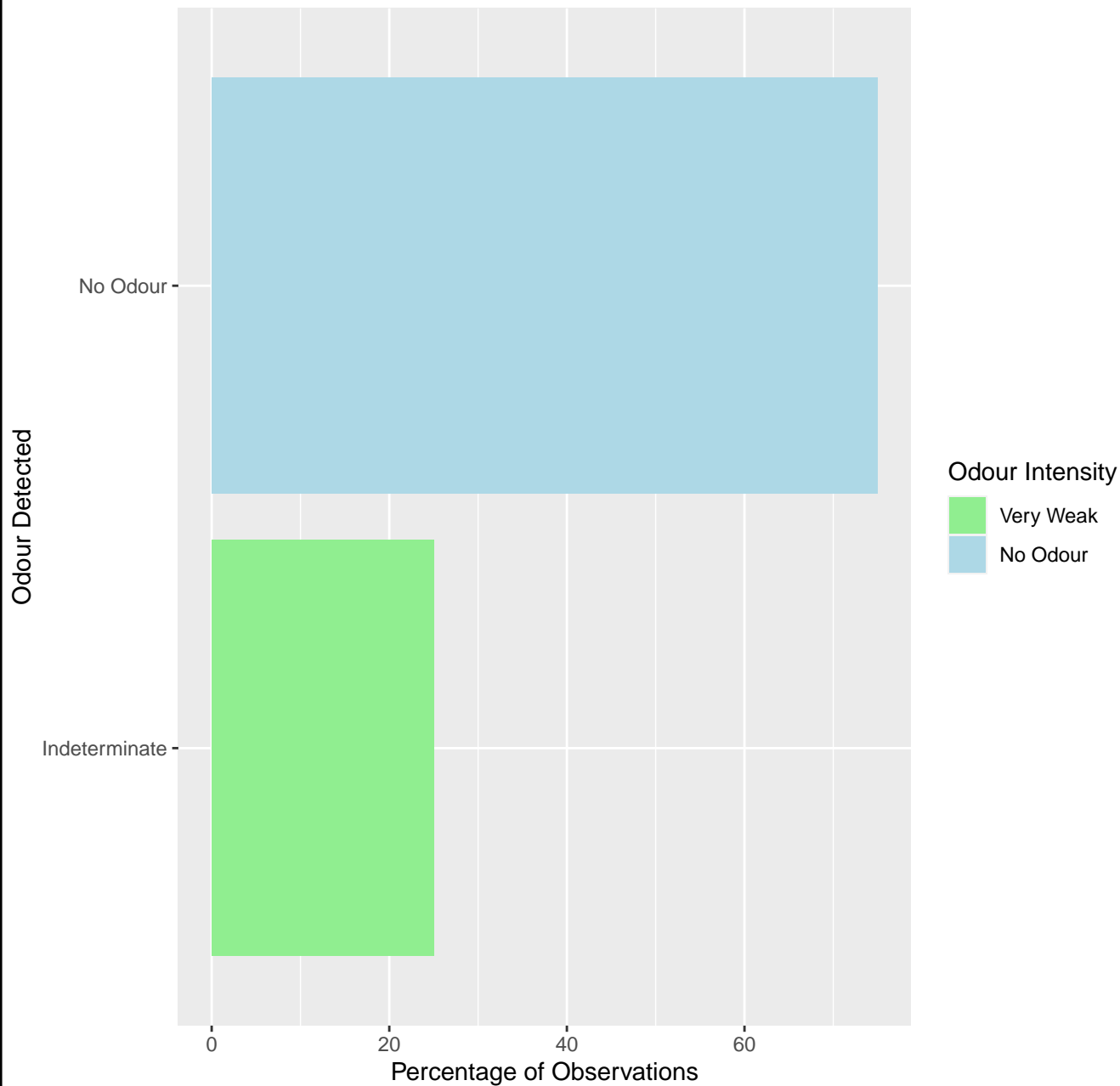
Air Quality Engineer

Reviewed by

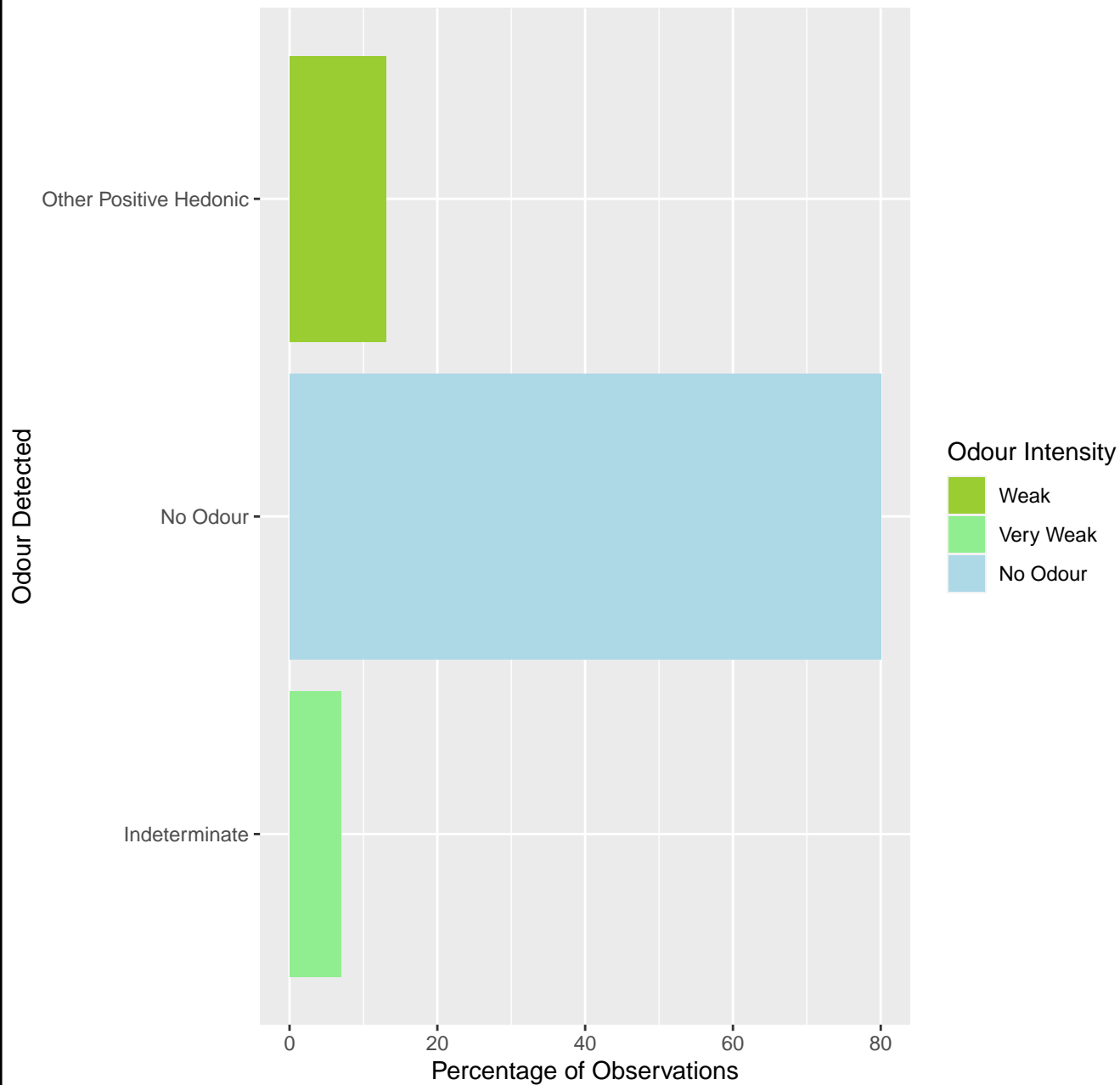


Technical Director

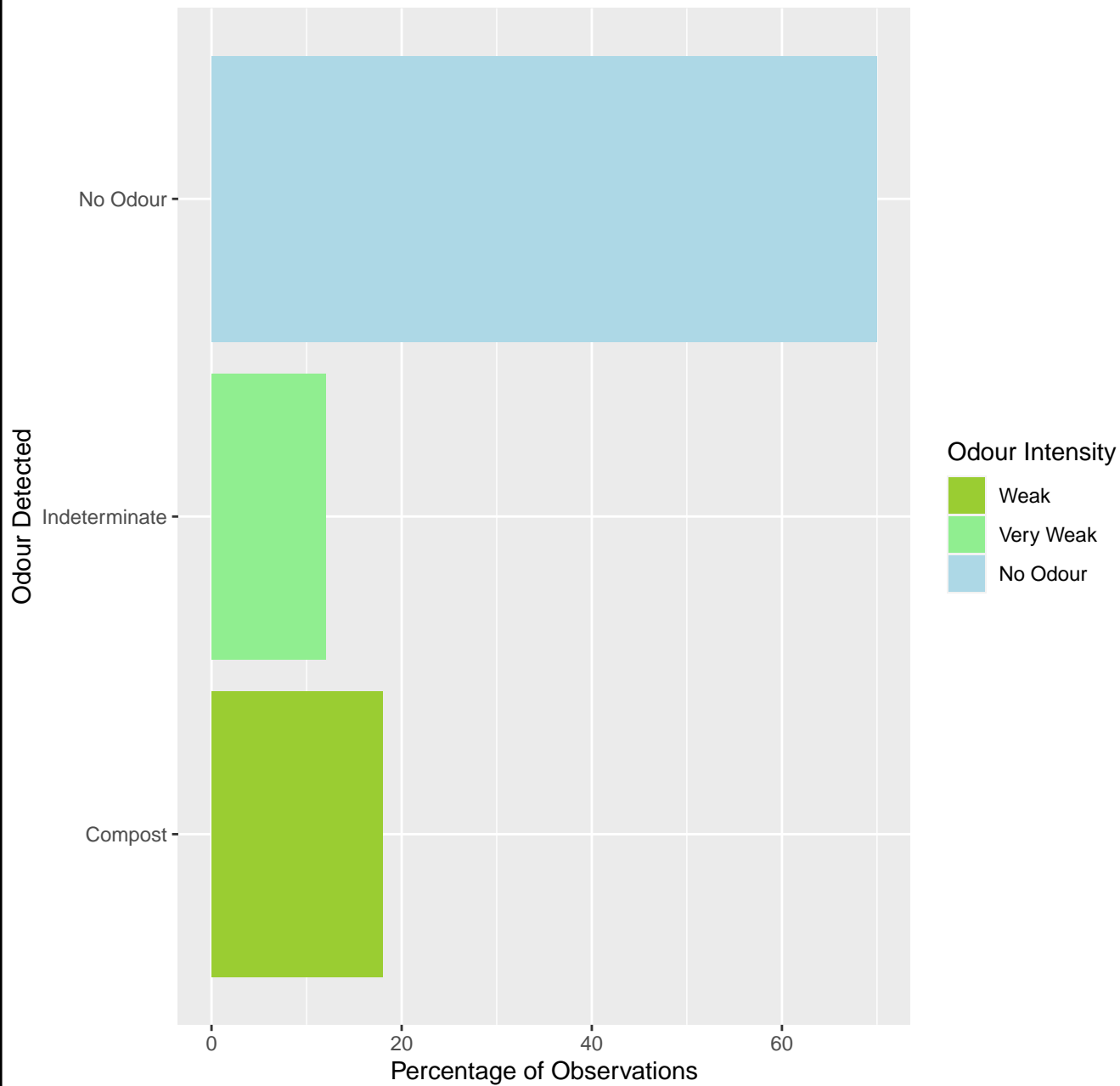
Site A : Summary of Odours Detected at Site



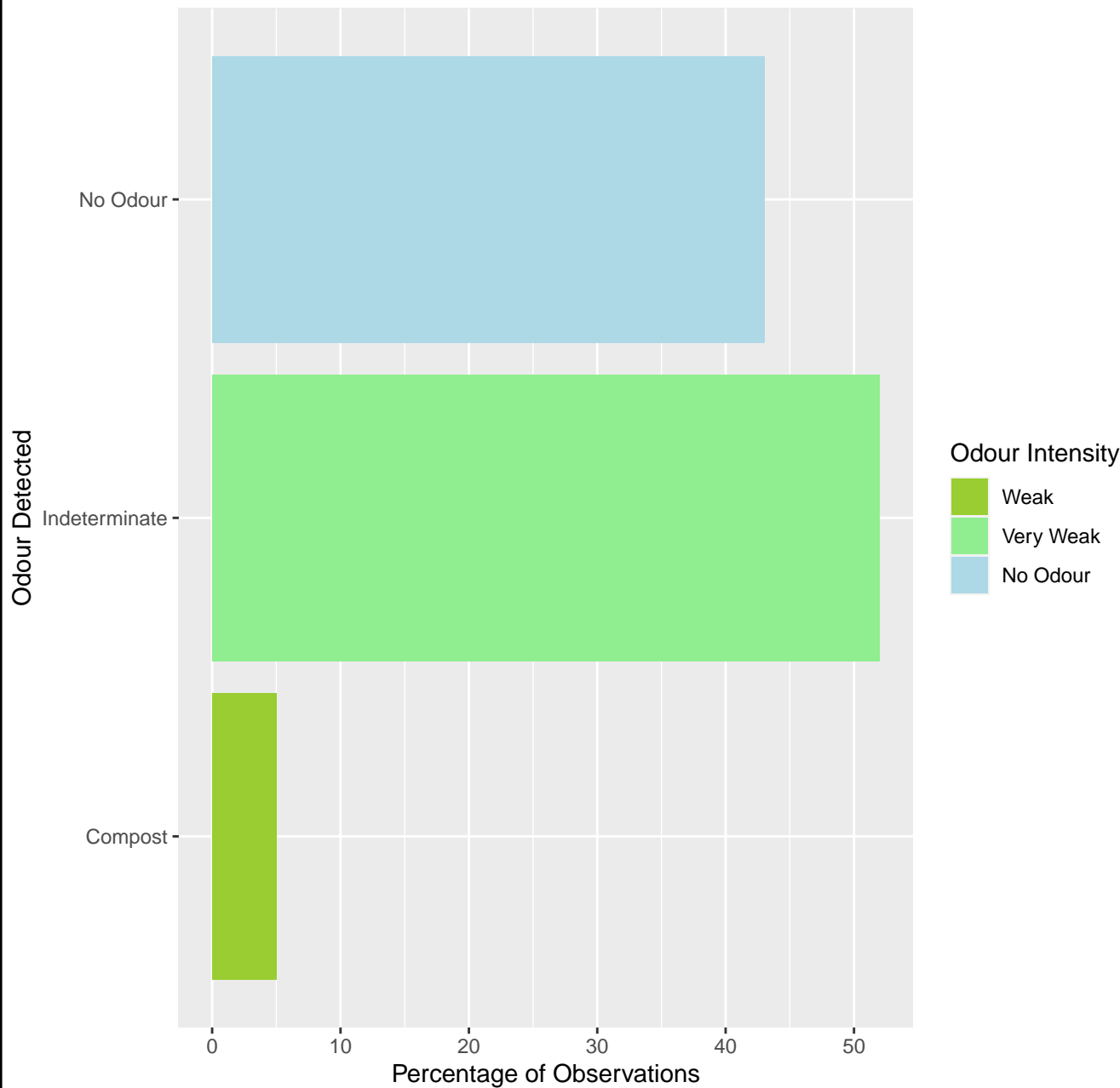
Site B : Summary of Odours Detected at Site



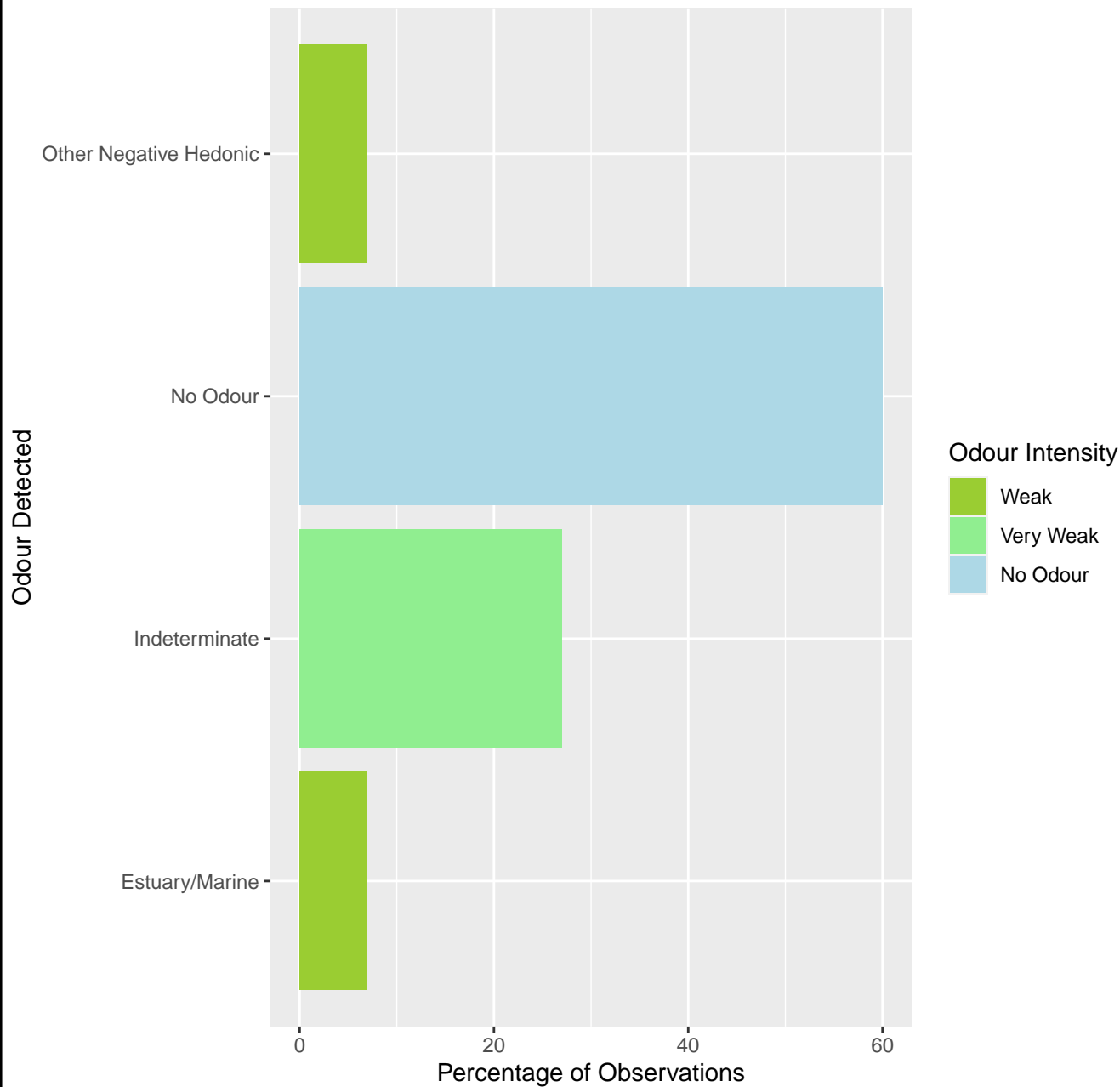
Site C : Summary of Odours Detected at Site



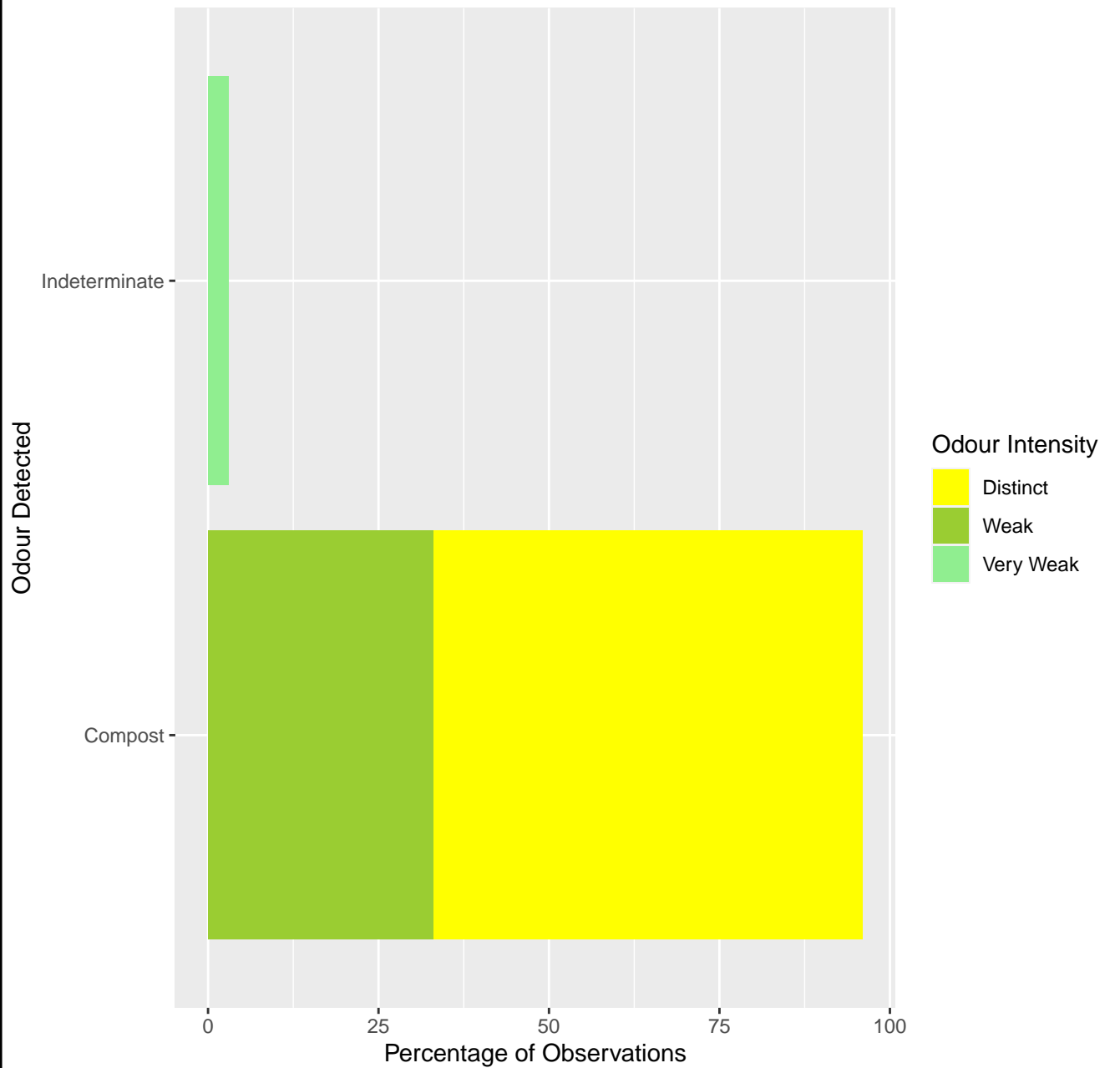
Site D : Summary of Odours Detected at Site



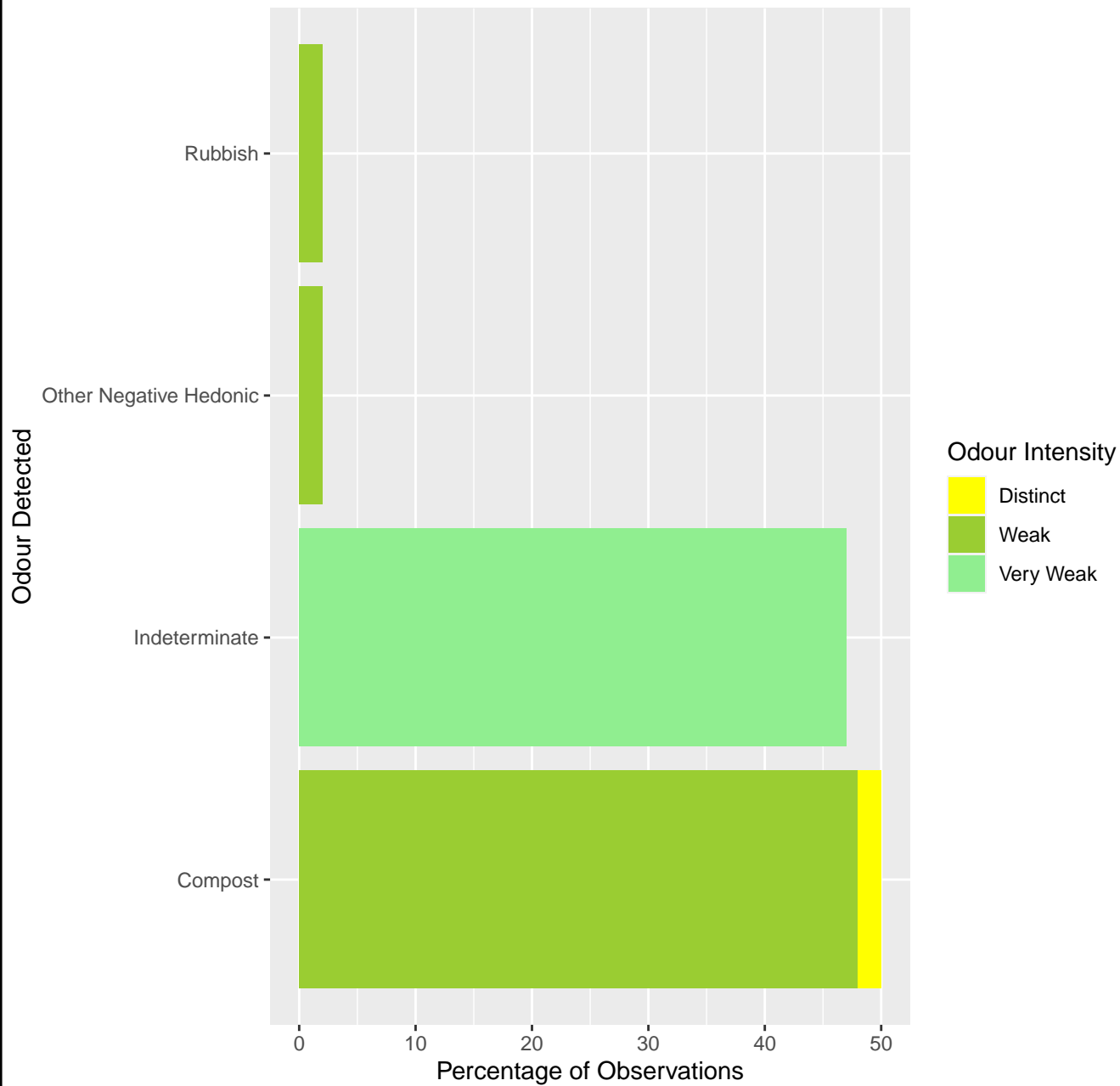
Site E : Summary of Odours Detected at Site



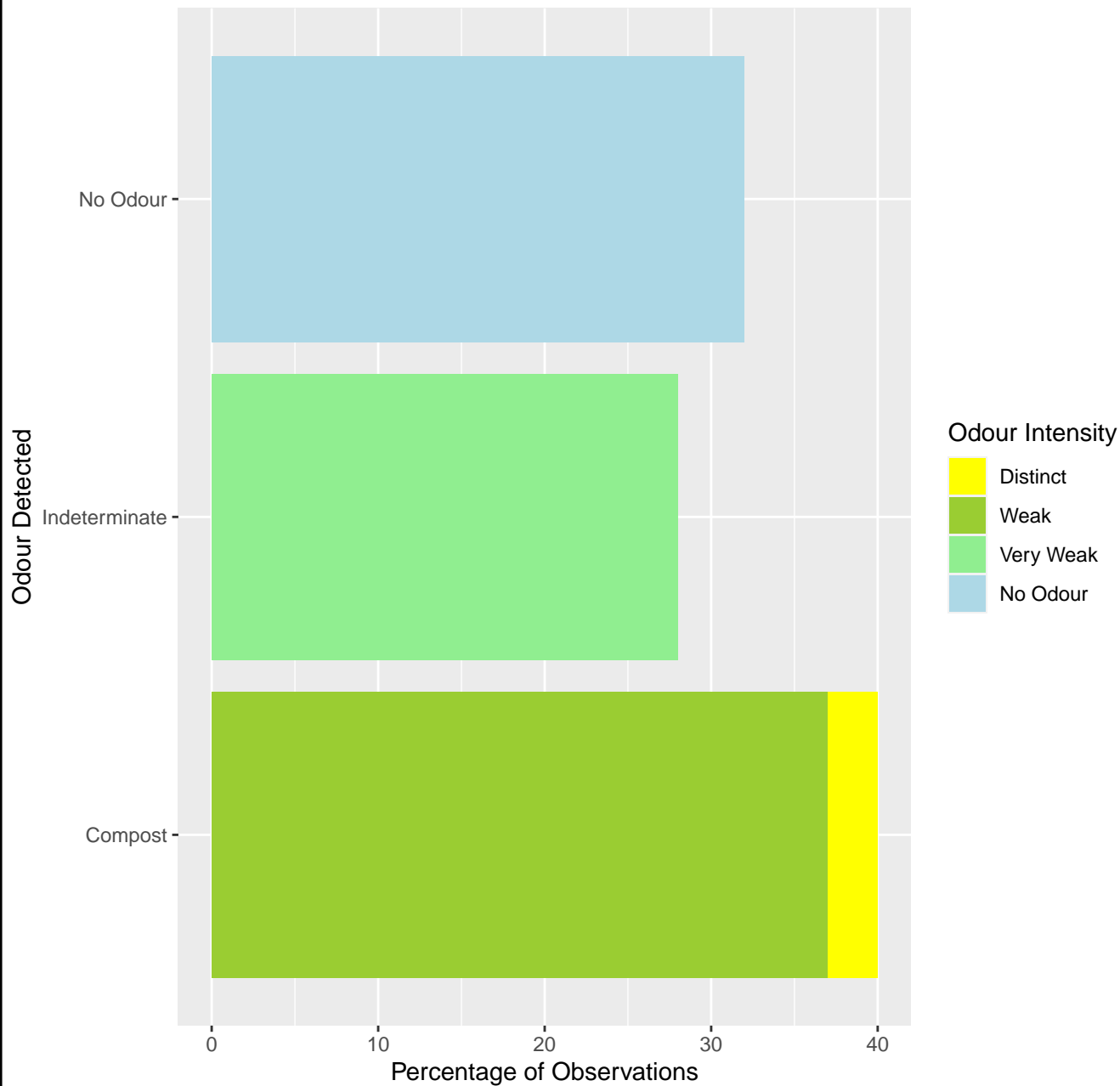
Site G : Summary of Odours Detected at Site



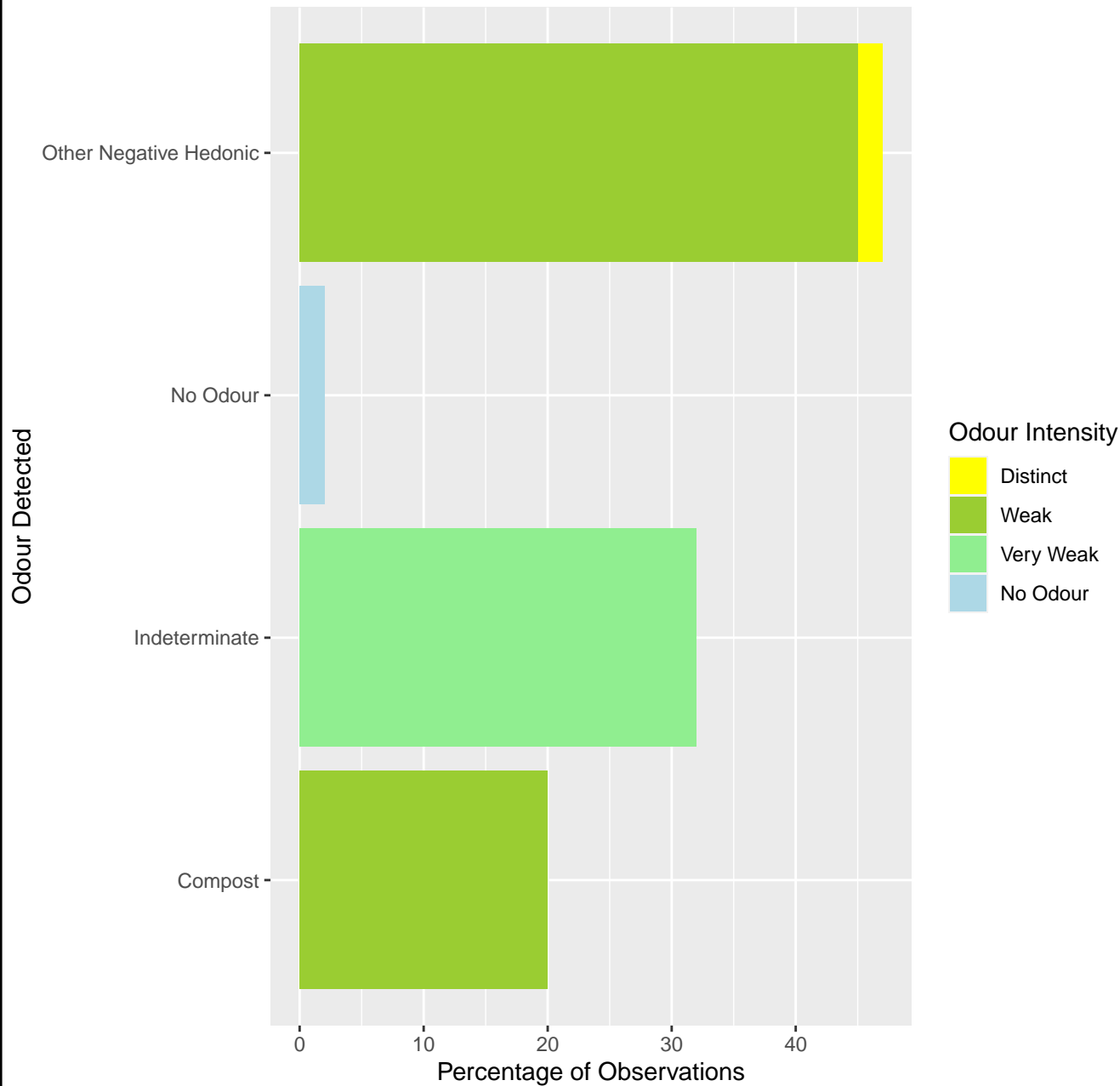
Site H : Summary of Odours Detected at Site



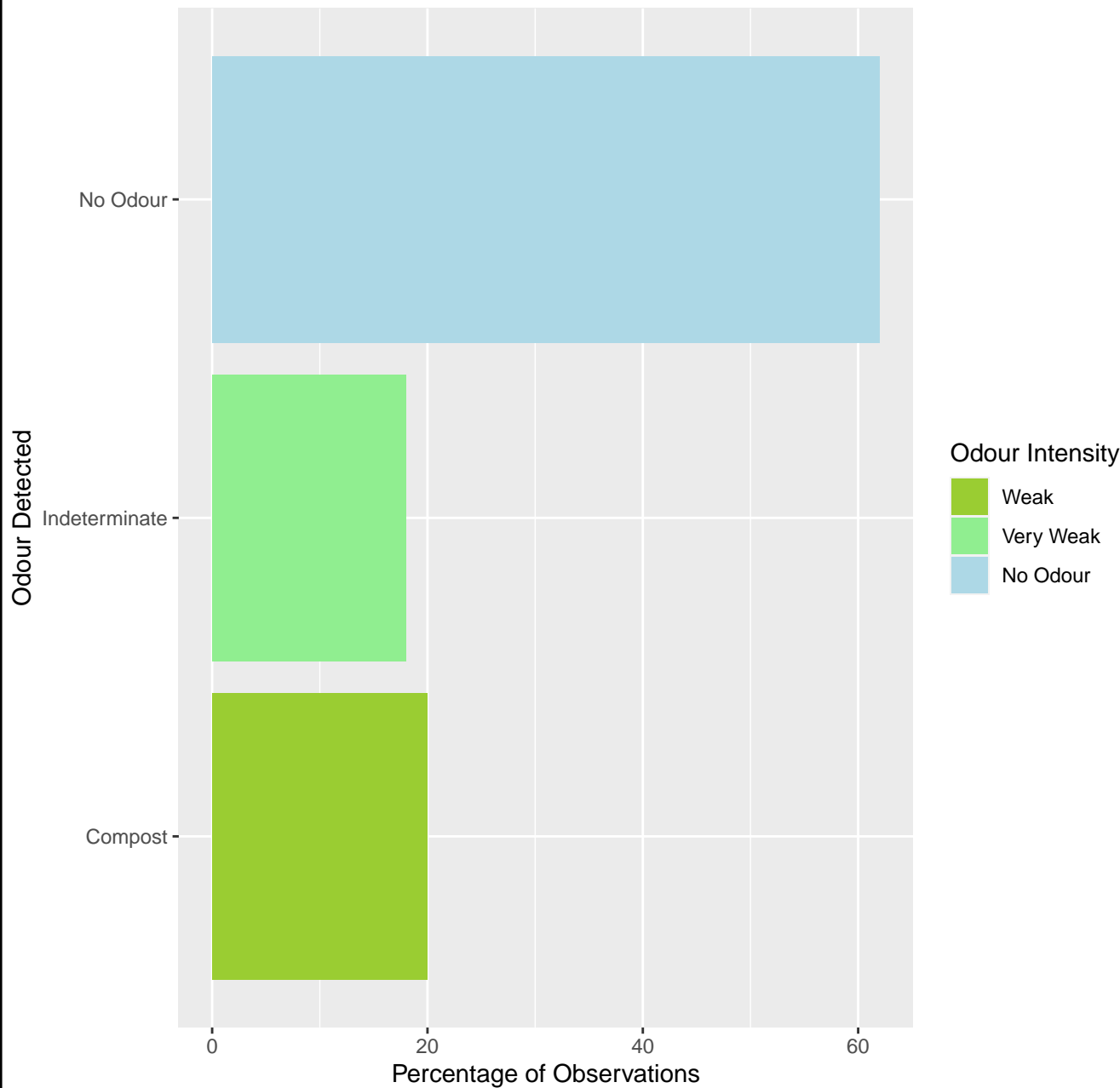
Site I : Summary of Odours Detected at Site



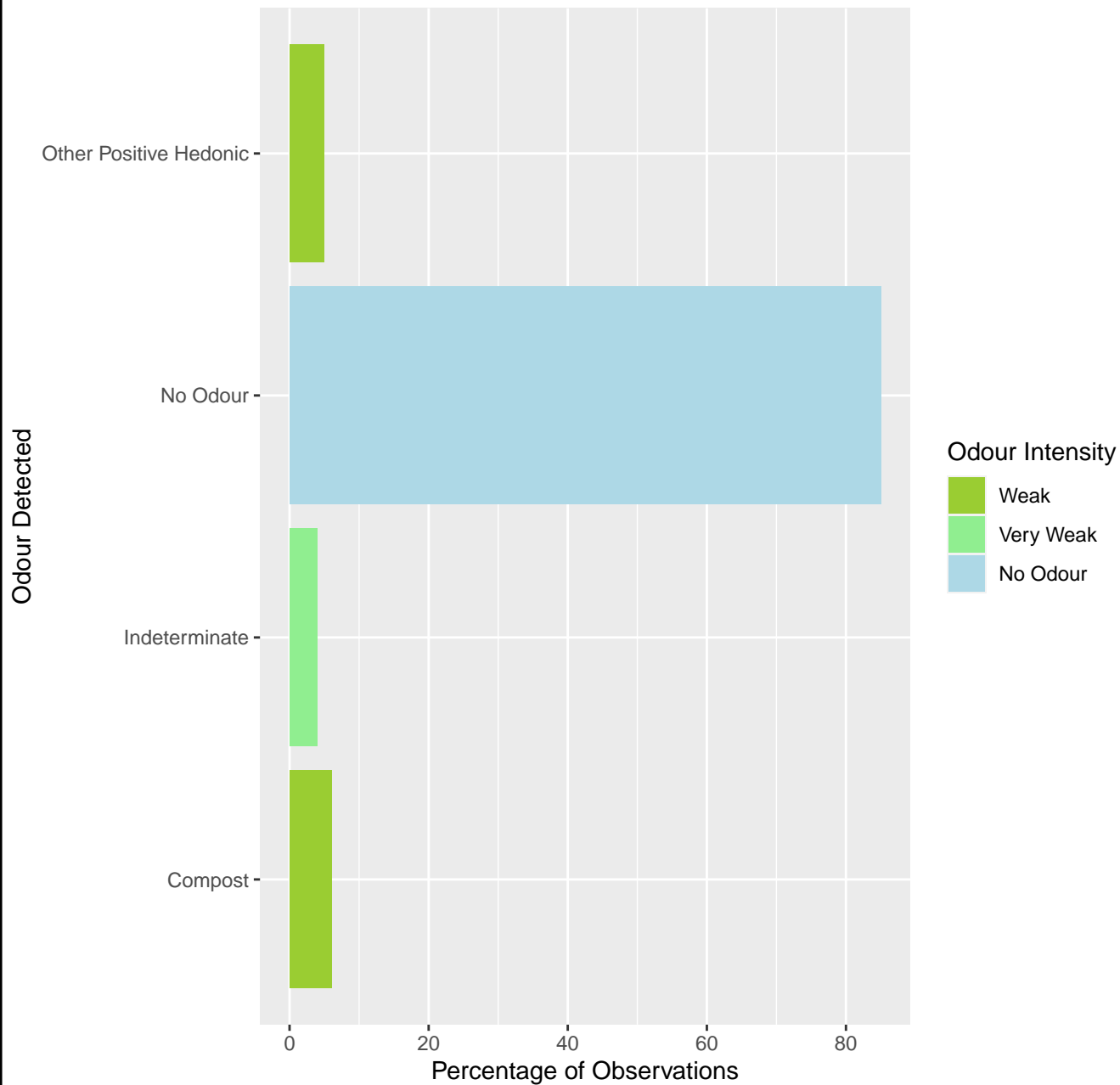
Site K : Summary of Odours Detected at Site



Site O : Summary of Odours Detected at Site



Site P : Summary of Odours Detected at Site



Site Q : Summary of Odours Detected at Site

