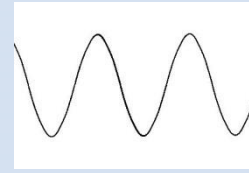


Smells Like Trouble: The FIDOL Method for Odour and Dust



Frequency



Intensity



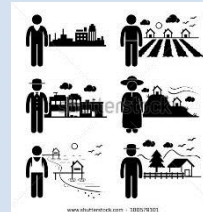
Duration



[O]dour character



Location



FIDOL

Used to assess amenity (nuisance) impacts

Amenity

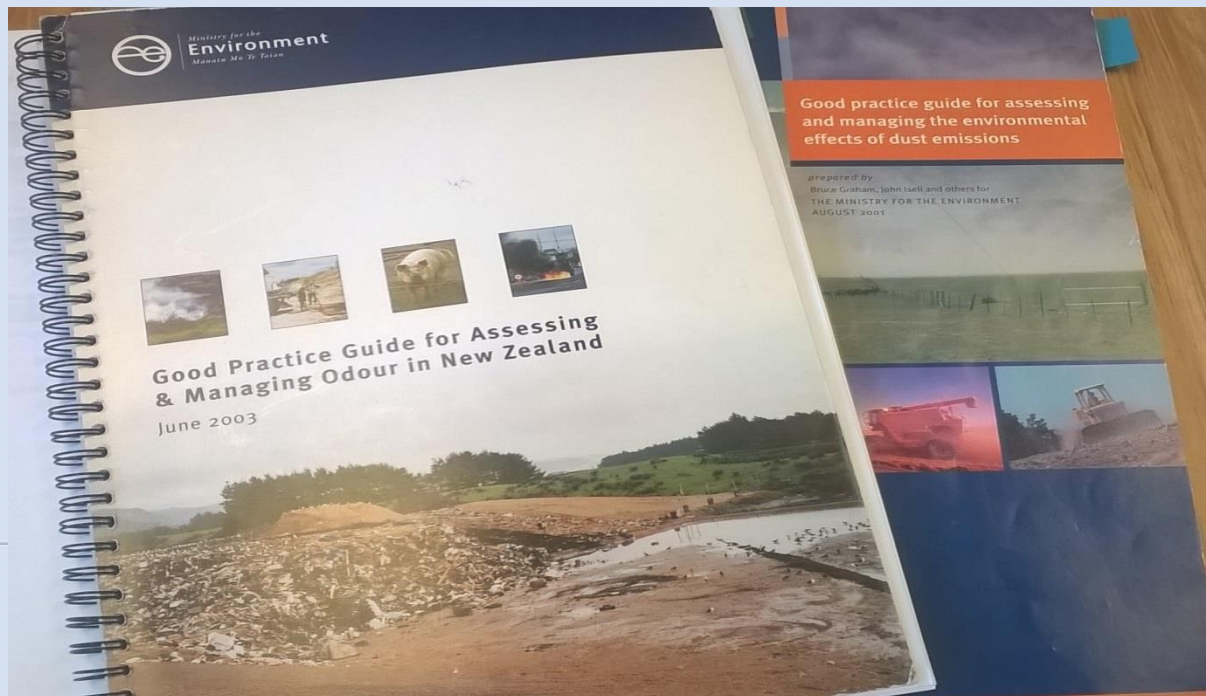
amenity values means those natural or physical qualities and characteristics of an area that contribute to people's appreciation of its pleasantness, aesthetic coherence, and cultural and recreational attributes (RMA)

Amenity



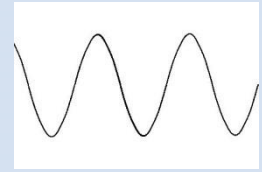
FIDOL

Recommended by the Good Practice Guides for Dust (2001) and Odour (2003) for determining offensive or objectionable effects



FIDOL - Frequency

How often is the song playing?



Chronic timescale: How often the effect occurs
(per year, week or day)

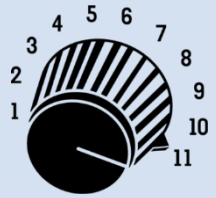
Acute timescale: Continuous or gusting

- Odour often comes and goes with gusts of wind.

Monitoring should be undertaken for at least 10 minutes at each assessment location.

FIDOL - Intensity

How loud is the song being played?



The intensity is the perceived strength.

For human responses, the perception of an effect is logarithmically-related to the actual extent.



Weber (1795-1878) – Fechner (1801-1887)

$$s = k \cdot \log i$$

Or, Stevens (1906-1973)

$$i = k \cdot s^\alpha$$

Where

i = perceived intensity;

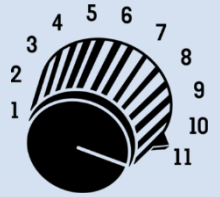
s = magnitude of stimulus (e.g. odour concentration);

k & α = constants (dependent on stimulus)



FIDOL - Intensity

How loud is the song being played?



German VDI 3882 odour intensity scale

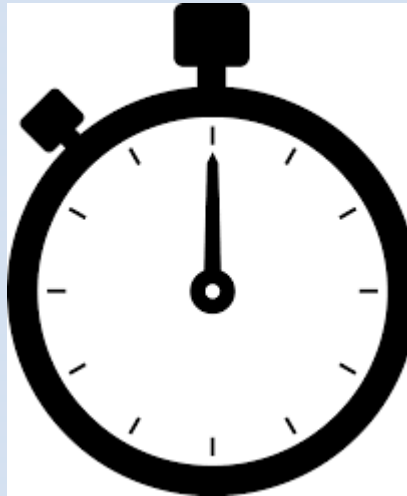
- 0 – Not perceptive
- 1 – Very weak
- 2 – Weak
- 3 – Distinct
- 4 – Strong
- 5 – Very strong
- 6 – Extremely strong

FIDOL - Duration

How long is the song?



Duration is the amount of time a person is exposed to an effect.



FIDOL – [Odour] character

What type of song?



The character (or hedonic tone for odour), is the subjective assessment of the pleasantness or unpleasantness of an effect.

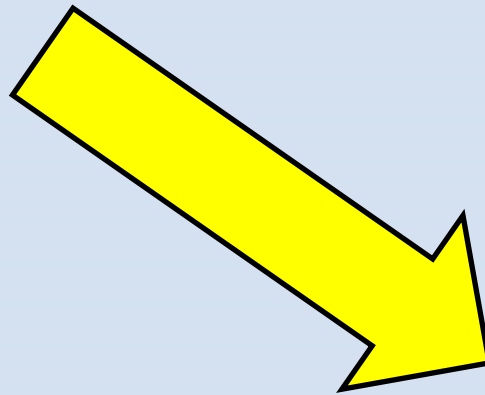
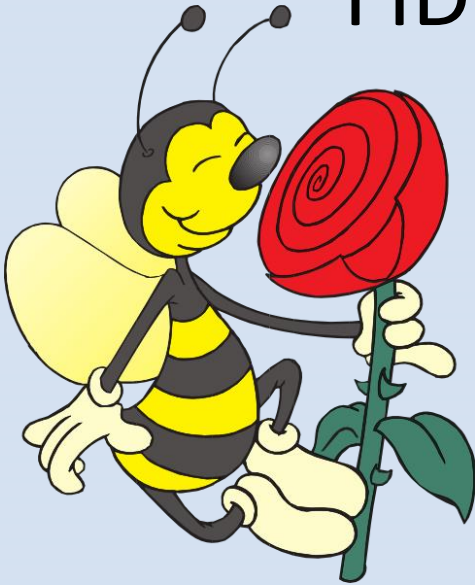
It is also sometimes known as 'offensiveness', but to avoid confusion between the overall aim of FIDOL (to determine 'offensive or objectionable' effects) and this one element, it is best to refer to the character.

Yes, this part is somewhat subjective! Let us introduce the Reasonable Person...



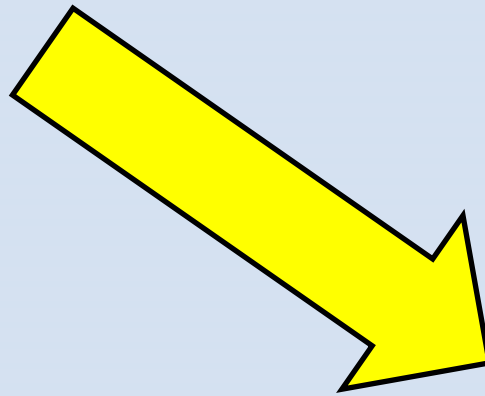
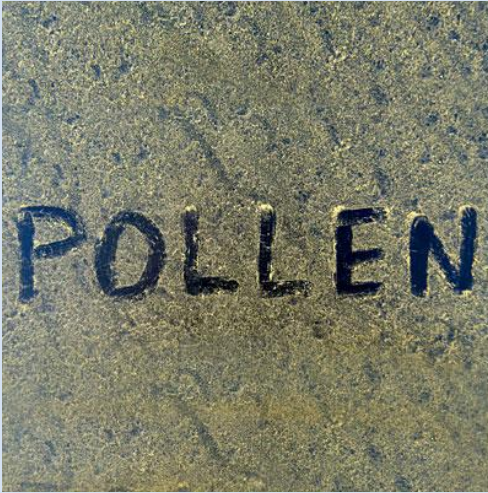
FIDOL – [Odour] character

What type of song?



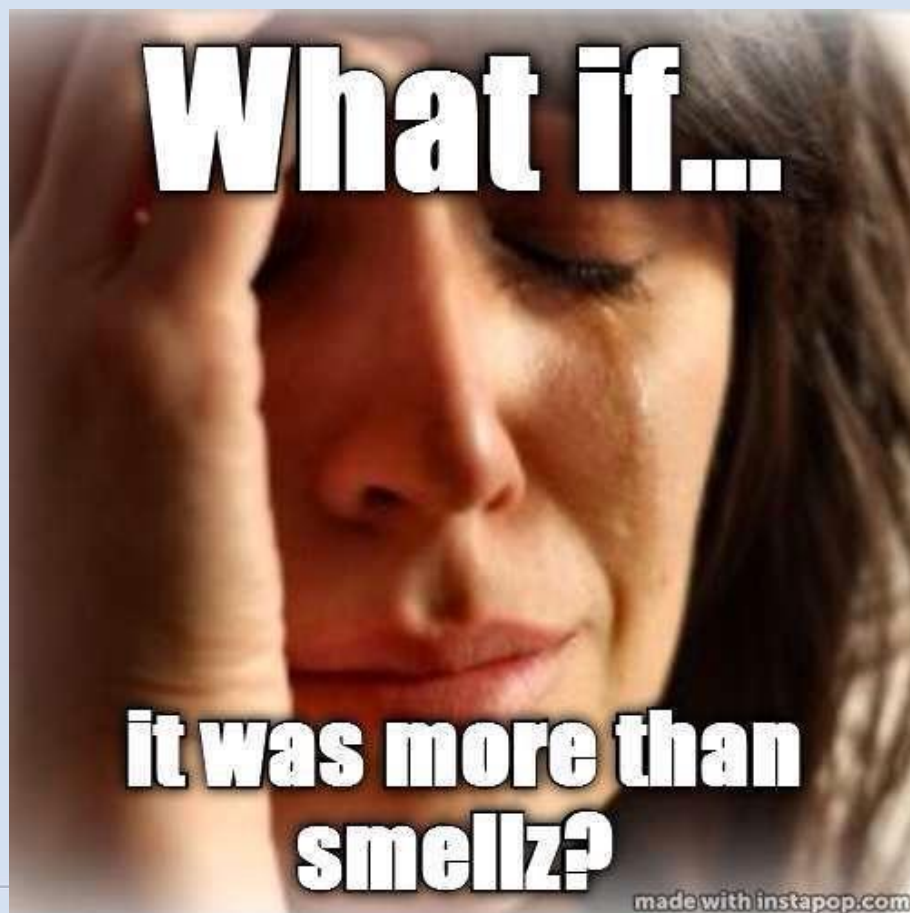
FIDOL – [Odour] character

What type of song?



FIDOL – [Odour] character

What type of song?



FIDOL - Location

Where are you listening to the song?

Where is the effect occurring?

What activities occur and who is exposed there at the time the effect is present?

What amenity expectations are there – any provided by planning documents?

FIDOL - Location

Where are you listening to the song?



FIDOL - Location

Where are you listening to the song?

Public perception of a rural environment . . .



FIDOL - Location

Where are you listening to the song?

is often very different from the reality.



FIDOL - Location

Where are you listening to the song?

“The residents of houses could reasonably be expected to be regularly present for extended periods as part of the normal pattern of the use of their land, and could reasonably expect enjoyment of a high level of amenity. The garden around the... houses are effectively part of their living area and experience” ([2016] NZEnvC 051: Craddock Farms Ltd v. Auckland Council)



vs.



FIDOL - Location

Where are you listening to the song?



Offensive or Objectionable?

A **holistic assessment** of all FIDOL factors to provide a robust framework for the Reasonable Person Test

Oxford English Dictionary:

Offensive – “...giving or meant to give offence...disgusting, foul-smelling, nauseous, repulsive...”

Objectionable - “open to objection, unpleasant, offensive”.

Case law has established that what may be offensive or objectionable under the RMA cannot be defined or prescribed except in the most general of terms. Each case will depend upon its own circumstances.

Offensive or Objectionable?

Good Practice Guide for Odour:

Possible field investigation outcomes	
I did not detect any odour	F I D O L
I did detect odour, but do not consider it would be offensive or objectionable in this location for any duration or frequency	F I D O L
I did detect odour, and consider that it would be offensive and objectionable if it became continuous	F I D O L
I did detect odour, and consider that it would be offensive and objectionable if it occurred frequently	F I D O L
I did detect odour, and consider it to be offensive and objectionable even in periods of short duration	F I D O L

360° Assessment

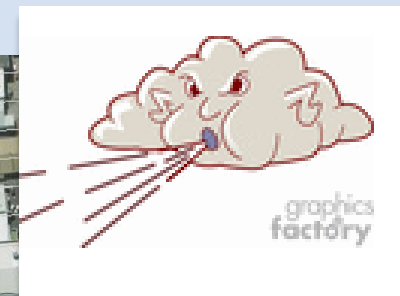
Vital to determine the source of the effect

Make an assessment of the weather conditions - particularly wind direction and speed

Identify the possible source of the complaint based on:

- information provided by complainant
- types of industry in close proximity to the complainant
- whether the potential source is upwind of the complainant

360° Assessment



Odour detected



Odour not detected

360° Assessment

After determining the most-likely source site, enter the site to seek to establish the exact source of the discharge. Most dischargers will appreciate the opportunity to identify and rectify a problem immediately.

Without thoroughly confirming the source of an offensive or objectionable effect, any enforcement action is open to dispute.

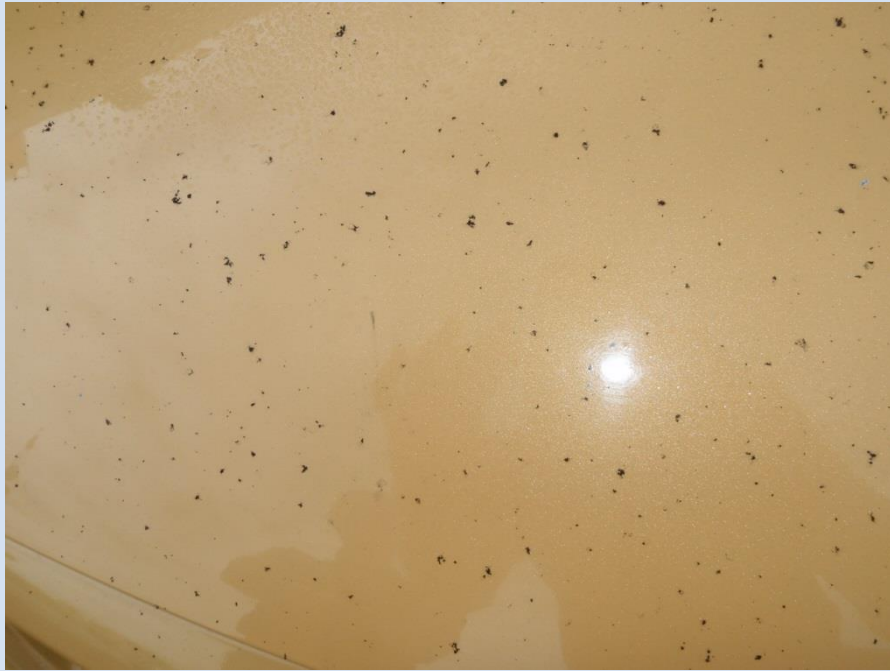
Case Studies



Particulate deposition

- Small-scale bakery established to the north east of an existing car yard
- Bakery operates in early morning, finishing before 7am
- Car yard staff arrive from 8am – notice soot on cars
- Particulate smears when wiped off









Station	Date(NZST)	Dir(DegT)	Speed(km/hr)	Dir StdDev	Spd StdDev
Auckland, Mangere Ews	20110627:0600	78	3.6	24	1.1
Auckland, Mangere Ews	20110627:0700	65	2.9	15	1.4
Auckland, Mangere Ews	20110627:0800	76	5	16	1.8
Auckland, Mangere Ews	20110627:0900	68	4.3	11	1.4
Auckland, Mangere Ews	20110627:1000	79	2.9	24	1.4

Actions

- Warning letter with some suggestions
- Bakery raised stack and cleaned ducting
- Issue still occurring
- Added additional coarse pre-filter – more heat resistant
- Much less particulate getting through to front of the fine, secondary filter.
- No further complaints after installing extra filter



Odour – ongoing complaints

- Regionally significant landfill
- Landfill operations begin early morning, removing daily cover
- Daily cover starts to be put back in place from early / mid afternoon
- Gas extraction system in place considered BPO
- Odour-suppressant sprays positioned around working face

Situation

- Over 50 odour complaints in first half of 2016
- Complaints from a number of different people.
- Odour witnessed by Council on 5 occasions
 - 1 offensive and objectionable
 - 3 times odour was 'very weak'
 - 1 time the odour was from a tractor

Problem

- Odours are short lived / intermittent
- Complaints are received from properties up to a kilometre from the site
- Difficult to do a 360° in area
- Complaints often in early morning before business hours response possible
- Lack of confirmed complaints is frustrating for all parties – acknowledged by Environment Court

Solution?

- Environment Court Hearing for Land-Use Consent extension of timeframe
- New conditions:
 - Weekly FIDOL odour assessments by landfill staff
 - Monthly FIDOL odour inspection by third party specialists
 - Annual review of odour complaints and control systems by third party specialists
 - Web-page for lodging complaints for immediate site investigation and for advertising CLG meetings

Questions?
Experiences?
Suggestions?