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Project				
Waste licence W0183-01 annual noise compliance survey 2014 at Starrus Eco Holdings (T/A Greenstar) waste management facility, Millennium Business Park, Ballycoolin, Dublin				
Client				
O'Callaghan Moran & Associates on behalf of Starrus Eco Holdings (T/A Greenstar)				
Project no	No pages	Client reference	©DixonBrosnan 2014	
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## Summary

On 17.06.14, DixonBrosnan noise consultants carried out the 2014 annual environmental noise survey at Starrus Eco Holdings (T/A Greenstar) integrated waste management facility at Millennium Business Park, Ballycoolin, Dublin 11. The survey is a requirement of waste licence W0183-01 issued by the Environmental Protection Agency in respect of the site.

$L_{Aeq\ 30\ min}$  levels recorded at three onsite stations were 46-69 dB. Noise emissions from the materials recovery building air management system dominated at all three stations. It is understood that noise limits specified in waste licence W0183-01 do not apply to these stations.

At the single offsite station, the only station to which the licence noise limits apply, the  $L_{Aeq\ 30\ min}$  level measured was 69 dB. Greenstar emissions were slightly audible during infrequent lulls in local traffic, giving rise to an estimated contribution of 41 dB. This contribution is lower than the 55 dB daytime limit specified in licence W0183-01. No tones or impulses were detected at any of the stations.

# 1 Introduction

1.1 DixonBrosnan noise consultants were instructed by O'Callaghan Moran & Associates, on behalf of their client Starrus Eco Holdings (T/A Greenstar), to carry out the 2014 annual environmental noise survey at the latter's integrated waste management facility at Millennium Business Park, Grange, Ballycoolin, Dublin 11. The survey is a requirement of waste licence W0183-01 issued by the Environmental Protection Agency in respect of the site. The objectives of the survey were as follows:

- To undertake noise monitoring in accordance with *International Standard ISO 1996-2 Acoustics – Description, measurement and assessment of environmental noise, Part 2: Determination of environmental noise levels (2007)*.
- To measure noise levels at three onsite stations (N1-N3) and one offsite station (NSL1) used during previous surveys, and shown in **appendix 1**.
- To assess measured levels in the context of noise limits set out in waste licence W0183-01, and presented in **appendix 2**. It is understood that the limits apply solely to the offsite monitoring station NSL1.

1.2 The noise survey was undertaken Tuesday 17.06.14. As the Greenstar facility does not operate at night, the survey was confined to daytime hours. Survey details, weather conditions and equipment specifications are listed in **appendix 3**. It was agreed with the client that survey methodology would follow that applied in previous surveys.

1.3 The facility was operating throughout the survey. Noise emissions arose from truck movements onsite, from processing plant and mobile plant within the materials recovery building, and from the building air management system plant and vents on the northern and southern façades. At one of the onsite stations, plant reversing alarms and dust collection system blow-down pulses at an adjacent premises were audible. Road traffic noise dominated at the offsite station. Low elevation aircraft passes were significant at all stations.

## 2 Results

2.1 Noise data recorded are presented in **appendix 4**, and summarised in **table 1** over. Frequency spectra and time history profiles are shown in **appendix 5**. No tones or impulses were detected at any of the stations.

2.2 The  $L_{Aeq\ 30\ min}$  level measured at station N1 on the northern site boundary was 46 dB. Noise emissions from the Greenstar building air management system were significant, generally masking all other sources. Stations N2 and N3 are located on site boundaries closer to the building, and both were dominated by the air management system and local yard activity.  $L_{Aeq\ 30\ min}$  levels measured here were 62 and 69 dB respectively. The licence noise limits do not apply to the three onsite stations.

Table 1: Noise data summary.

Station	N1	N2	N3	NSL1
Period	Daytime	Daytime	Daytime	Daytime
Facility specific $L_{Aeq\ 30\ min}$ (dB)	46	62	69	41
Tone objectively detected	x	x	x	x
Tone attributable to facility	x	x	x	x
Facility audibly tonal	x	x	x	x
Facility audibly impulsive	x	x	x	x
Facility rated $L_{Req\ 30\ min}$ (dB)	46	62	69	41
Limit (dB)	-	-	-	55
Compliance	N/A	N/A	N/A	✓

2.4 The  $L_{Aeq\ 30\ min}$  level recorded at the offsite station NSL1 was 69 dB, due entirely to local road traffic noise which was almost continuous and dominant. Emissions from the Greenstar building air management system were slightly audible during infrequent lulls in traffic, giving rise to an estimated contribution of 41 dB, and thus lower than the 55 dB daytime limit specified in licence W0183-01.

## 3 Conclusions

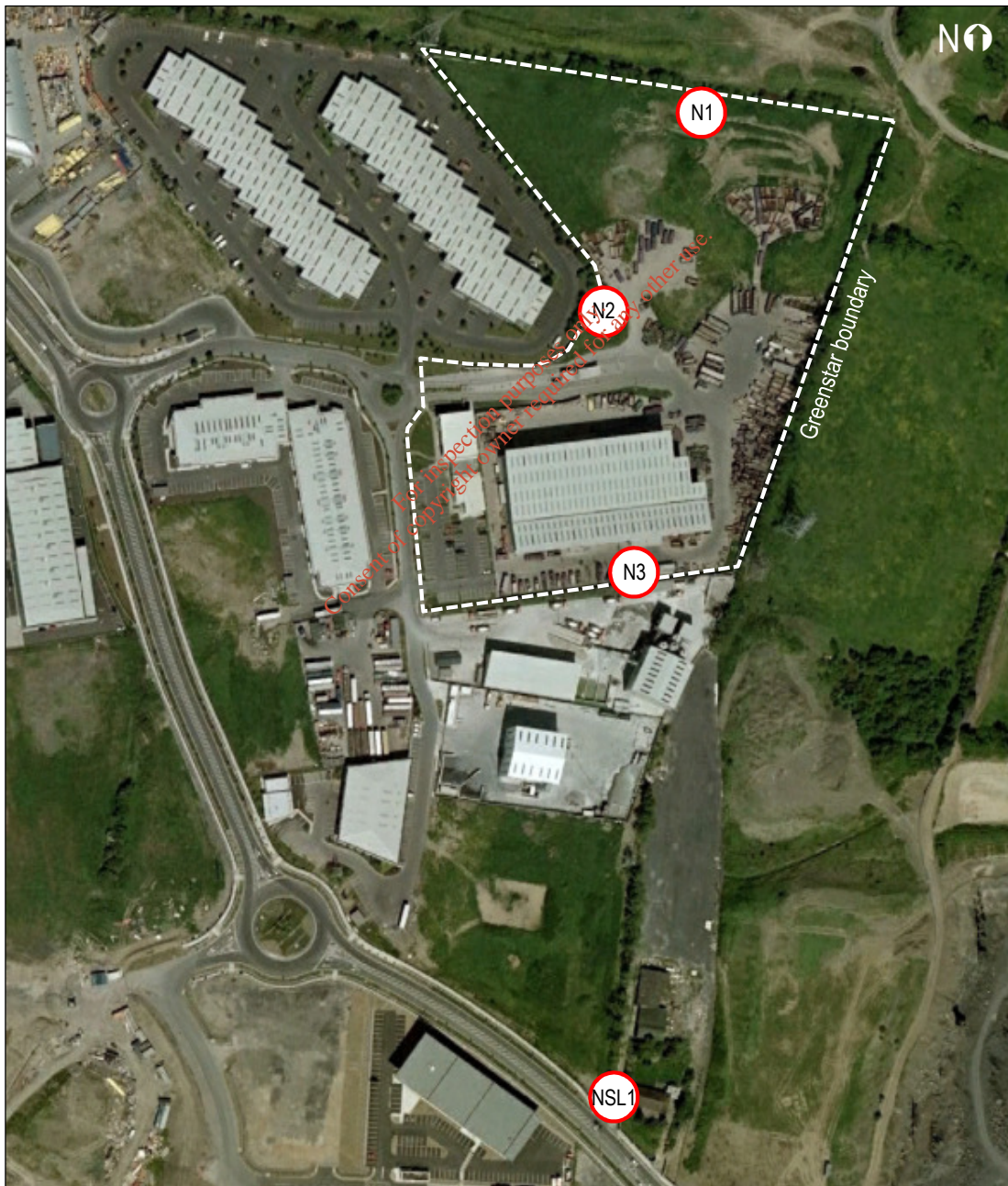
3.1  $L_{Aeq\ 30\ min}$  levels recorded at the three boundary stations were 46-69 dB. Noise emissions from the materials recovery building air management system dominated at all three stations. It is understood that noise limits specified in waste licence W0183-01 do not apply to these stations.

3.2 At the offsite sensitive station NSL1, the only station to which the licence noise limits apply, the  $L_{Aeq\ 30\ min}$  level measured was 69 dB. Greenstar emissions were slightly audible during infrequent lulls in local traffic, giving rise to an estimated contribution of 41 dB. This contribution is lower than the 55 dB daytime limit specified in licence W0183-01.

3.3 No tones or impulses were detected at any of the stations.

# Appendix 1: Noise stations

Station	ITM NGR	Location	Propagation route terrain
N1	710369 741187	Midway along site N boundary	Level; paved yard, unpaved yard with large number of stored bins/skips, disturbed ground
N2	710324 741081	Site boundary, immediately NE of weighbridge office	Level; paved yard
N3	710347 740951	S boundary, towards SE corner	Level; paved yard
NSL1	710342 740680	m S of site, adjacent to public road, at gate adjacent to derelict dwelling	Level; intervening quarry, disturbed ground



## Appendix 2: W0183-01 noise conditions

- 5.5 There shall be no clearly audible tonal component or impulsive component in the noise emissions from the activity at the noise sensitive locations.

### **C.1 Noise Emissions:** (Measured at the monitoring points indicated in *Table D.1.1*).

Day dB(A) $L_{Aeq}$ (30 minutes)	Night dB(A) $L_{Aeq}$ (30 minutes)
55	45

### **D.1 Monitoring Locations**

Monitoring locations shall be those as set out in Table D.1.1 and Drawing J10 of the application.

**Table D.1.1 Noise, surface water and wastewater Monitoring Locations**

NOISE	SURFACE WATER	WASTEWATER	Dust Deposition, PM10 and Micro Organisms <sup>Note 1</sup>
STATIONS	STATIONS	STATIONS	STATIONS
N1 N2 N3 N4 <sup>Note 2</sup> N5 <sup>Note 2</sup>	SW-1 SW-2	SE-1	DS01 DS02 DS03 DS04

**Note 1:** Bioaerosol monitoring to be carried out at one upwind and two downwind locations chosen from DS01, DS02, DS03 and DS04

**Note 2:** Two nearest noise sensitive receptors to be agreed in advance by the Agency.

**Note:** One noise sensitive receptor NSL1 was subsequently agreed with the EPA.

### **D.2 Noise**

**Table D.2.1 Noise Monitoring Frequency and Technique**

Parameter	Monitoring Frequency	Analysis Method/Technique
$L(A)_{EQ}$ [30 minutes]	Annual	Standard <sup>Note 1</sup>
$L(A)_{10}$ [30 minutes]	Annual	Standard <sup>Note 1</sup>
$L(A)_{90}$ [30 minutes]	Annual	Standard <sup>Note 1</sup>
Frequency Analysis(1/3 Octave band analysis)	Annual	Standard <sup>Note 1</sup>

**Note 1:** "International Standards Organisation. ISO 1996. Acoustics - Description and Measurement of Environmental noise. Parts 1, 2 and 3."



## Appendix 3: Survey details

File	Project ref.	1131
	Client	O'Callaghan Moran & Associates
	Location	Greenstar, Millennium Business Park, Ballycoolin, Dublin
	Stations	N1 N2 N3 NSL1
	Purpose	2014 annual waste licence compliance survey
	Comment	Facility operating Pre NG4 methodology requested by client
Event	Period	Daytime
	Date	17.06.14
	Day	Tuesday
	Time	1000-1245
	Operator	Damian Brosnan BSc MIOA MIEI
Conditions	Cloud cover	0 %
	Precipitation	0 mm
	Temperature	20 rising to 21 °C
Wind	Direction	NE
	Speed	0-1 m/s
	Measurement	Anemo anemometer 2 m above ground level
Sound level meter	Instrument	Bruel & Kjaer Type 2250
	Instrument serial no.	2506594
	Microphone serial no.	2529531
	Application	BZ7224 Version 2.5
	Bandwidth	Broadband & 1/3 octaves
	Max input level	141.16 dB
	Broadband weightings	Time: Fast Frequency: AC
	Spectrum weightings	Time: Fast Frequency: Z
	Windscreen correction	UA-1650
	Sound field correction	Free-field
	UKAS calibration	21.01.14.12
	Calibrating laboratory	Bruel & Kjaer Denmark
	Calibration certificate	Available on request
Onsite calibration	Time	17/06/2014 10:03:07
	Calibration type	External
	Sensitivity	47.41 mV/Pa
	Post measurement check	93.9 dB
Onsite calibrator	Instrument	Bruel & Kjaer Type 4231
	Instrument serial no.	1723667
	UKAS calibration	21.01.14
	Calibrating laboratory	Bruel & Kjaer Denmark
	Calibration certificate	Available on request
Uncertainty	Instrumentation	±1 dB (IEC 61672:2002 Class 1)
	External	±0-2 dB (station & weather dependent, estimated)
	Total	±4 dB (estimated, including expanded uncertainty)
Methodology	Standards	ISO 1996 Part 1 (2003) & Part 2 (2007) EPA NG4 (2012)
	Exceptions	-
	Intervals	30 min

# Appendix 4: Noise data

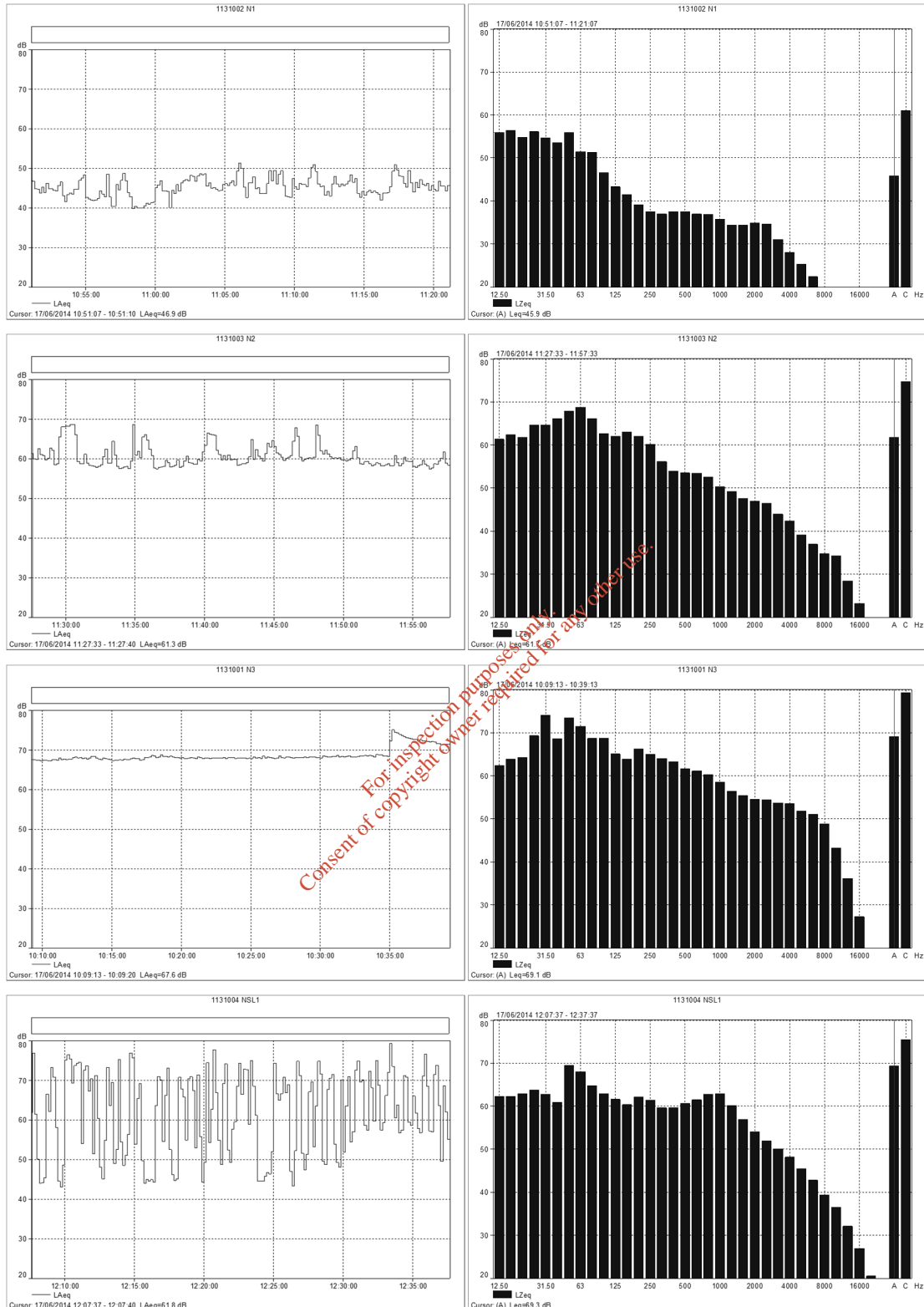
Survey date: 17.06.14

Station	Time	L <sub>Aeq</sub> 30 min dB	L <sub>AF10</sub> 30 min dB	L <sub>AF90</sub> 30 min dB	Specific level* dB	Noise audible
N1	1051-1121	46	49	41	46	Greenstar air handling plant noise continuously audible at low level. Intermittent truck movements around nearest yards also audible at low level. Intermittent aircraft passes at low altitude significant when present. Bird song/calls. Distant traffic audible to E.
N2	1127-1157	62	65	58	62	Air handling plant and inbuilding processing noise continuously clearly audible and dominant. Truck activity around yard areas and through weighbridge dominant when present. No other noise audible apart from intermittent aircraft passes and crow calls.
N3	1009-1039	69	72	68	69	Air handling system noise emissions continuously dominant, masking all other onsite sources apart from sporadic truck movements locally in yard. Offsite, intermittent reversing alarms and regular blow down pulse audible at adjacent premises.
NSL1	1207-1237	69	73	45	41	Frequent passing road traffic dominant, and almost continuously audible on approaches. During infrequent traffic lulls, Greenstar air handling plant slightly audible, in addition to fans at commercial premises to SW, bird song/calls and aircraft.

\*Specific level: L<sub>Aeq</sub> level considered attributable to facility during interval, determined using real time assessment, field notes, time history profiles, statistical analysis, frequency spectra, spectral statistics and near field correction if applicable.



# Appendix 5: Time history profiles & frequency spectra



# Appendix 6: Glossary

Ambient	Total noise environment at a location, including all sounds present.
A-weighting	Weighting or adjustment applied to sound level to approximate non-linear frequency response of human ear. Denoted by suffix A in parameters such as $L_{Aeq T}$ , $L_{AF10 T}$ , etc.
Background level	A-weighted sound pressure level of residual noise exceeded for 90 % of time interval T. Denoted $L_{AF90 T}$ .
Broadband	Noise which contains roughly equal energy across frequency spectrum. Does not contain tones, and is generally less annoying than tonal noise.
Decibel	Shortened to dB. Unit of noise measurement scale. Based on logarithmic scale so cannot be simply added or subtracted. 3 dB difference is smallest change perceptible to human ear. 10 dB difference is perceived as doubling or halving of sound level. <b>Throughout this report noise levels are presented as decibels relative to 20 <math>\mu</math>Pa.</b> Examples of decibel levels are as follows: 20 dB: very quiet room; 30-35 dB: night-time rural environment; 55-65 dB: conversation; 80 dB: busy pub; 100 dB: nightclub.
Fast response	0.125 seconds response time of sound level meter to changing noise levels. Denoted by suffix F in parameters such as $L_{AF10 T}$ , $L_{AF90 T}$ , etc.
Frequency	Number of cycles per second of a sound or vibration wave. Low frequency noise may be perceived as hum, while whine represents higher frequency. Range of human hearing approaches 20-20,000 Hertz.
Hertz	Shortened to Hz. Unit of frequency measurement.
Impulse	Noise which is of short duration, typically less than one second, sound pressure level of which is significantly higher than background.
Interval	Time period T over which noise parameters are measured at position. Denoted by T in $L_{Aeq T}$ , $L_{AF90 T}$ , etc.
$L_{Aeq T}$	Equivalent continuous sound pressure level during interval T, effectively representing average A-weighted noise level.
$L_{AF10 T}$	Sound pressure level exceeded for 10% of interval T, usually used to quantify traffic noise.
$L_{AF90 T}$	Sound pressure level exceeded for 90% of interval T, usually used to quantify background noise. May also be used to describe noise level from continuous steady or almost-steady source, particularly where local noise environment fluctuates.
$L_{Req T}$	Rating noise level, derived from $L_{Aeq T}$ plus specified adjustments for tonal and impulsive characteristics. Equivalent to $L_{Ar T}$ used by EPA.
Masking	The rendering inaudible of one noise source by another noise source(s) which may be louder, or may contain significant acoustic energy in the same part of the frequency spectrum. In the latter case, any tone(s) in the original source emissions may become inaudible.
Noise sensitive location	Any dwelling house, hotel or hostel, health building, educational establishment, place of worship or entertainment, or any other facility or area of high amenity which for its proper enjoyment requires absence of noise at nuisance levels.
1/3 octave band	Frequency spectrum may be divided into octave bands. Upper limit of each octave is twice lower limit. Each octave may be subdivided into thirds, allowing greater analysis of tones.
Specific level	$L_{Aeq T}$ level produced by specific noise source under consideration during interval T, measured directly or by estimation or calculation.
Tone	Character of noise caused by dominance of one or more frequencies which may result in increased noise nuisance.
Z-weighting	Standard weighting applied by sound level meters to represent linear scale. Denoted by suffix Z in parameters such as $L_{Zeq T}$ , $L_{ZF90 T}$ , etc. used to describe 1/3 octave band levels in frequency spectra.

**In this report units are generally presented using US National Institute Of Standards & Technology guidelines.**