



**ENVIRONMENTAL NOISE ASSESSMENT AT
BALLYMOUNT ROAD LOWER, DUBLIN 22
LICENCE REF NO. 208-1**

Prepared for:

Oxigen Environmental Ltd
Ballymount Road Lower
Clondalkin
Dublin 22

Prepared by:

Fehily Timoney & Co.
Floor 2, Mill House
Ashtown Gate,
Navan Road,
Dublin 15

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Abstract: This report covers ambient daytime and night-time noise monitoring and traffic counts conducted at the Ballymount Road Lower site on the 23th June 2006 as part of a planning application for increased operational hours at the facility.

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1. INTRODUCTION

1.1. Background

This assessment examines the noise impact of extending the operational hours of an existing Material Recovery Facility at Ballymount Road Lower, Dublin 22. The site is operated and managed by Oxigen Environmental Limited and is a licensed waste facility, operating under Environmental Protection Agency Licence Number 208-1. The hours of operation of the site are not limited under the provisions of the waste licence. However, the planning permission for the site limited the hours of operations. This assessment will assess the impact of proposed 24-hour operations. Daytime and night-time noise measurements and traffic counts were carried out at Ballymount on 23rd June 2006.

1.2. Aim of the Survey

The aim of this survey is to establish the impact of current noise emissions from the facility and to assess the potential impact of a planned extension of operational hours from 17 hours to 24 hours. In order to assess the noise impacts of the site, three sets of measurements at each monitoring were taken at different times of the day, as follows;

Table 1.1 Survey Measurement Times

Time of Day	Site Operational
Daytime (15:00 – 18:00)	Yes
Late Evening (21:00 – 22:30)	Yes
Night-time (23:00 – 00:30)	No

1.3. Details of the Noise Sources On-site

Waste delivery and processing activities were in progress at the site during all daytime and late evening noise measurements. The site was not operational during the night-time measurements after 23:00hrs. The main site operations at the site which lead to noise emissions include;

- Vehicle movements / Reversing sirens
- Skip movement
- Material handling on site
- Trommel

- Compactor Trailer Loading

Additional noise sources included background environmental noises such as traffic and human activity.

1.4. Measurement Units, Standards and Definitions

The unit of sound pressure level is the decibel (dB). This is calculated as a logarithm of sound. A change of 10 dB corresponds approximately to halving or doubling the loudness of sound. The use of decibels (A-weighted), dB (A), as the basic unit for general environmental and traffic noise is widely accepted. Decibels measured on sound level meter incorporating this frequency weighting differentiates between sounds of different frequency in a manner similar to the human ear. That is measurements in dB (A) broadly agree with human beings assessment of loudness. It has been demonstrated that noise levels in dB (A) from a wide range of sources adequately represent loudness.

In order to understand the terms used below, some definitions of the terms used are outlined as follows:

- L_{AF10} Refers to those noise levels in the top 10 percentile of the sampling interval; it is the level which is exceeded for 10% of the measurement period. It is used to determine the intermittent high noise level features of locally generated noise and usually gives an indicator of the level of traffic.
- L_{AF90} Refers to those noise levels in the lower 90 percentile of the sampling interval; it is the level which is exceeded for 90% of the measurement period. It will therefore exclude the intermittent features of traffic and is used to estimate a background level.
- L_{Aeq} The average level recorded over the sampling period. The closer the L_{Aeq} value is to either the L_{AF10} or L_{AF90} value indicates the relative impact of the intermittent sources and their contribution. The relative spread between the values determines the impact of intermittent sources such as traffic on the background.

Impulsive noise: a noise of short duration (typically less than one second), the sound pressure level of which is significantly higher than the background.

Tonal noise: A noise source that is concentrated in a narrow band of the frequency spectrum.

2. METHODOLOGY

2.1. Equipment and Measurement Conditions

Both noise surveys were carried out using a Bruel and Kjaer noise meter. 2260 Type 1 Sound Level Meter (SLM). The instrument was calibrated prior to commencing the survey using the recommended calibration procedure and a known pure tone noise source. In addition the SLM is calibrated every two years by an external, independent laboratory; the most recent calibration was carried out by Bruel & Kjaer on the 7th June 2006.

Good measurements require calm conditions to avoid spurious effects on the microphone, particularly at low frequencies. On 23rd June 2006, the wind speed was measured between 1.0 – 2.0 m/s during all measurements.

All measurements were taken outdoors, and are considered representative of the noise regime in the region of the site. To minimise the influence of reflections all measurements were taken at least 3.5 metres from reflecting surfaces, other than the ground.

2.2. Monitoring Locations

The site is located in a largely industrial and commercial area. The site is bounded on all sides by public or distributor roads for the industrial park. The nearest noise sensitive location is to the north-west of the site, where a number of cottages are located. Many of these are used as commercial premises but a number remain occupied as residences. This residential area has been taken as the nearest noise sensitive location and is the focus of this assessment.

The nearest noise sensitive location, three boundary locations and one on-site location were monitored. The monitoring points corresponded to the monitoring locations specified in the site EPA Waste Licence Application Drawing No. J.1 (Ref. No. 208-1) – see Appendix 1.

- N1** Located off-site to the north-west of the site, adjacent to the nearest noise sensitive locations; a group of residences on the Ballymount Road.
- N2** Boundary Location on the north boundary of the facility.
- N3** Boundary location on the south boundary of the facility.
- N4** Boundary location on the east boundary of the facility.
- N5** On-site location near the west boundary of the site.

2.3. Compliant History

The facility has been operating at the site since October 2004. The facility currently operates from 06:30 to 23:30, which includes operations outdoors and indoors. During this period, no complaints have been received regarding noise emissions, or any other operations, at the site.

2.4. Details of the survey

David Flynn B.Sc. of Fehily Timoney & Company carried out the noise survey at the Oxigen Environmental Limited's Site at Ballymount Cross on the afternoon and evening of the 23rd June 2006.

A total of three monitoring events were conducted, with measurements taken consecutively at all five locations during each monitoring event.

The first round of monitoring was taken during the day-time operation of the site. Monitoring began at 15:00hrs and 30-minute measurements were taken at each location.

The second round of monitoring was taken late in the evening period, while the site was still operational. This monitoring began at 21:00hrs and 15-minute samples were taken at each location.

The third round of monitoring was taken during the night period. During this period the facility had ceased to operate. This monitoring began at 23:00hrs and 15-minute samples were taken at each location.

2.5. Traffic Count

In addition to the noise monitoring, a night and day time traffic count survey was undertaken at the noise sensitive location, (N1) adjacent to the Turnpike Road situated to the north west of the facility. All vehicular movements on the road were counted. The traffic count was divided into light vehicles and HGV vehicles.

3. RESULTS

Table 3.1: Results of Noise Monitoring

Location		N1			N2			N3			N4			N5		
Measurement		Laeq	L10	L90	Laeq	L10	L90	Laeq	L10	L90	Laeq	L10	L90	Laeq	L10	L90
Day*	30min	69	73	52	66	69	52	69	74	47	64	67	51	53	55	49
Late Evening*	15min	66	69	47	65	54	46	67	72	46	54	57	48	51	53	48
Night**	15min	63	62	37	60	54	45	63	65	44	60	63	50	53	54	42

* Site operating during measurement

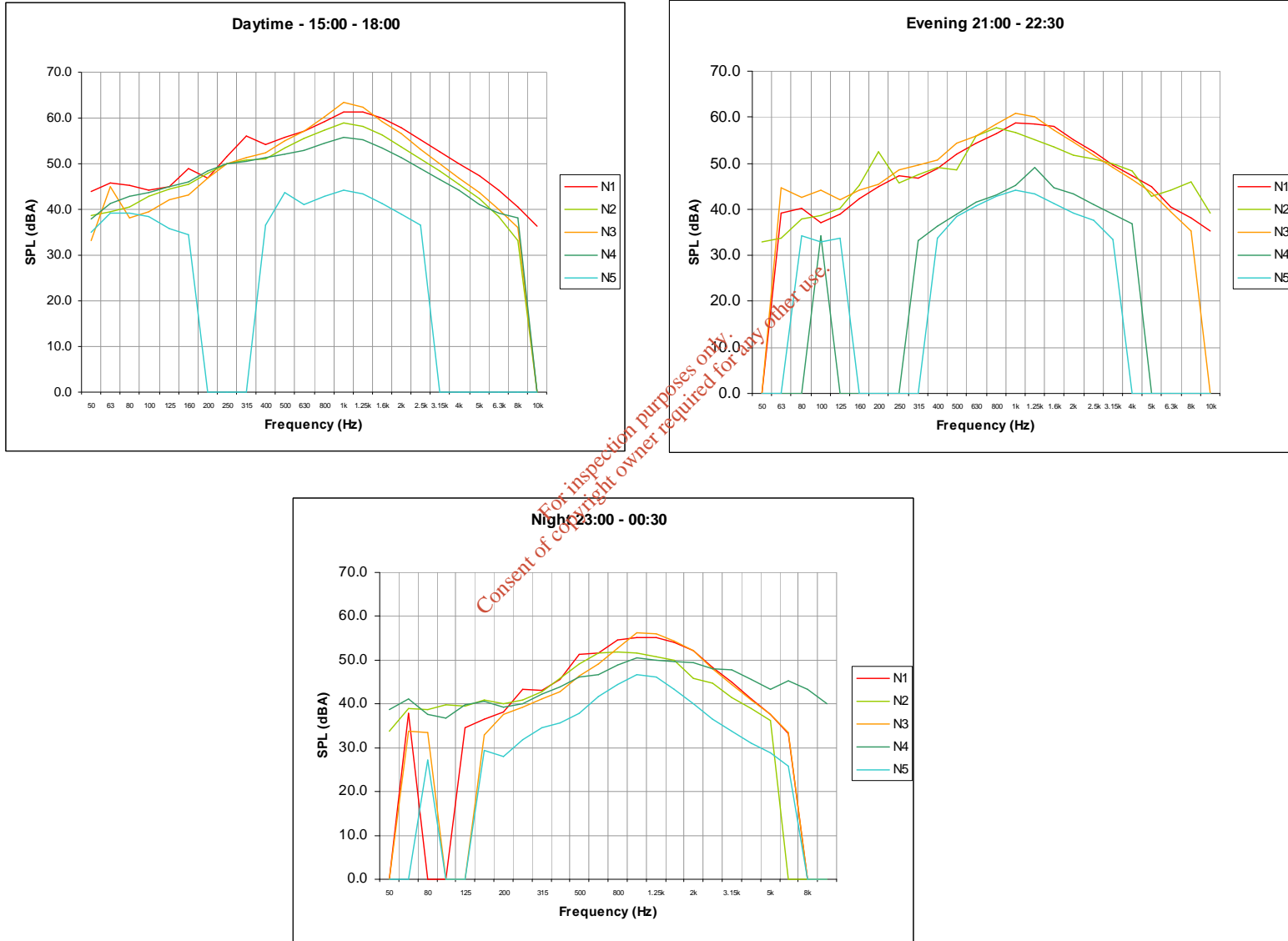
** Site not operating during measurement

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Table 3.2 1/3 Octave Analysis

Hz	50	63	80	100	125	160	200	250	315	400	500	630	800	1k	1.25k	1.6k	2k	2.5k	3.15k	4k	5k	6.3k	8k	10k
Day																								
N1	44.0	45.9	45.2	44.2	45.0	49.0	46.9	51.5	56.1	54.3	55.9	57.2	59.2	61.3	61.3	60.1	58.0	55.3	52.6	50.1	47.5	44.3	40.5	36.3
N2	38.7	39.5	40.4	43.0	44.4	45.6	47.8	49.9	50.8	51.1	53.4	55.4	57.3	59.0	58.2	56.4	53.7	51.1	48.5	45.4	42.4	38.3	33.1	0.0
N3	33.2	44.9	38.1	39.6	42.0	43.2	46.8	49.9	51.2	52.3	55.1	57.2	60.3	63.5	62.3	59.3	56.6	53.1	50.0	46.9	43.7	39.9	36.1	0.0
N4	37.8	41.2	43.0	43.8	45.1	46.1	48.3	50.0	50.6	51.2	52.2	53.0	54.4	55.9	55.2	53.5	51.2	48.9	46.7	44.2	41.0	39.3	38.1	0.0
N5	35.1	39.2	39.3	38.3	35.9	34.5	0.0	0.0	0.0	36.6	43.6	41.1	42.9	44.3	43.4	41.2	38.9	36.6	0.0	0.0	0.0	0.0	0.0	0.0
Late-Evening																								
N1	0.0	39.1	40.2	37.0	39.0	42.2	44.8	47.3	46.7	48.8	51.9	54.4	56.5	58.8	58.6	58.0	55.2	52.5	49.7	47.4	44.8	40.6	38.1	35.3
N2	33.0	33.6	37.8	38.6	40.2	45.2	52.6	45.7	47.6	49.0	48.5	55.8	57.6	56.8	55.2	53.6	51.6	50.9	50.0	48.2	42.8	44.1	45.9	39.2
N3	0.0	44.6	42.5	44.1	42.1	44.1	45.4	48.6	49.5	50.7	54.2	55.9	58.4	60.9	60.0	57.2	54.7	51.8	49.1	46.6	43.6	39.4	35.2	0.0
N4	0.0	0.0	0.0	34.3	0.0	0.0	0.0	0.0	33.1	36.3	38.8	41.6	43.0	45.2	49.2	44.6	43.3	41.1	38.8	36.8	0.0	0.0	0.0	0.0
N5	0.0	0.0	34.3	32.8	33.8	0.0	0.0	0.0	0.0	33.8	38.3	40.8	42.9	44.2	43.4	41.3	39.2	37.6	33.4	0.0	0.0	0.0	0.0	0.0
Night																								
N1	0.0	37.8	0.0	0.0	34.6	36.5	38.1	43.5	43.0	45.7	51.3	51.6	54.7	55.2	55.2	54.1	52.1	48.4	44.9	41.2	37.6	33.2	0.0	0.0
N2	33.8	38.9	38.6	39.9	39.6	40.9	40.2	40.9	42.8	45.9	49.1	51.7	52.0	51.5	50.8	50.0	45.8	44.7	41.4	38.9	36.3	0.0	0.0	0.0
N3	0.0	33.7	33.5	0.0	0.0	32.9	37.7	39.3	41.2	42.8	46.4	49.2	52.8	56.4	55.9	54.4	52.1	48.1	44.4	40.9	37.6	33.5	0.0	0.0
N4	38.7	41.3	37.7	36.8	39.8	40.5	39.3	40.0	42.2	44.0	46.1	46.8	49.0	50.6	50.0	49.6	49.4	48.0	47.7	45.7	43.5	45.2	43.5	40.2
N5	0.0	0.0	27.3	0.0	0.0	29.3	28.1	31.8	34.6	35.7	37.9	41.6	44.6	46.8	46.0	43.3	40.1	36.6	33.7	30.9	28.7	25.7	0.0	0.0

Figure 3.1 Spectral Analysis Charts



4. DISCUSSION

4.1. Introduction

The results for all measurements taken in the region show that the noise in the area is relatively high. Daytime noise levels ($L_{Aeq(30-min)}$) range from 53 dB(A) – 69 dB(A), with night-time $L_{Aeq(30-min)}$ ranging from 53 – 63 dB(A). Traffic is the dominant noise at all measurement locations, with traffic sources both adjacent to measurement sites and distant traffic audible at all locations.

4.2. Notes on Result Interpretation

L_{Aeq} is the average noise level recorded over the sampling period. The closeness of the L_{Aeq} value to either the L_{AF10} or L_{AF90} indicates the relative impact of the intermittent sources and their contribution.

L_{AF10} refers to those noise levels in the top 10 percentile of the sampling interval. It is the level that is exceeded for 10% of the measurement period. It is used to determine the intermittent high noise level features on locally generated noise. L_{AF10} usually gives an indicator of the level of nearby traffic.

L_{AF90} refers to those noise levels in the lower 90 percentile of the sampling interval. It is the level that is exceeded for 90% of the measurement period. It will therefore exclude intermittent features such as traffic. L_{AF90} is used to estimate the background level.

The results from the daytime and night-time noise monitoring events for both the boundary and noise sensitive locations are discussed below.

4.3. Noise Sensitive Location

Two daytime measurements were taken, one measurement during mid-afternoon and another measurement in the late evening. This was done to assess the impact of the noise from the facility throughout the day. The high volume of vehicular traffic travelling along the adjacent Turnpike Road was the major contributing factor to the elevated ambient noise levels recorded at this location. This is demonstrated by high L_{AF10} levels of 73 dB(A) and 69 dB(A) during the day and evening respectively, see section 4.7.

While these levels are above the waste licence compliance level of 55 dB (A) during the monitoring period the noise is not attributable to any operations at the site. The background (L_{AF90}) noise level at the noise sensitive location for both day-time measurements is 52 dB(A) and 47 dB(A) for day and evening respectively.

Background noise consisted of site operations at a logistics facility across the road from the noise sensitive location, pedestrians walking and jogging on the adjacent footpath and distant traffic. There were no noise sources originating at the site audible at the NSL during this monitoring.

Subsequent to the site operations finishing for the evening; a measurement was taken at 23:30 hrs. The recorded L_{Aeq} for N-1 (nearest noise sensitive location) during the night-time monitoring event was 63 dB(A). However, the site was not operational during this measurement and the noise levels were as a result of traffic on the Turnpike Road and distant traffic on the surrounding roads and motorway. This is confirmed by the corresponding L_{AF10} and L_{AF90} for N-1; which are 62 dB(A) and 37 dB(A) respectively. The L_{AF10} value (traffic related) is the dominant contributing factor in raising the overall L_{Aeq} value. The site was not in operation during this measurement.

4.4. Boundary Locations

Two sets of daytime measurements were taken, one set of three boundary measurements during mid-afternoon (15:00 – 18:00) and another set of three boundary measurements in the late evening (21:00 – 22:30). Three boundary locations were monitored during the survey, corresponding to EPA noise monitoring locations; N2, N3 and N4. The site is surrounded by busy roads on all four sides. To the west and south lie Turnpike Road and Ballymount Road Lower. These are both busy access roads between Ballymount industrial areas and the N7/M50/City Centre routes. The north and east of the site is bounded by distributor roads for the Merrywell Industrial Estate. This estate is the location for a number of logistics companies which operate 24 hours per day. As a result, these roads are also in use 24 hours per day. However, gates are closed on the southern access to the estate to exclude general traffic during the night period.

The L_{Aeq} at N4 was 69 dB(A). This location is away from the majority of operations at the Oxigen Site, and the majority of the noise at this location was attributable to the adjacent Ballymount Road Lower and traffic entering and leaving the DHL depot, and vehicle shunting operations within that site to the east of the Oxigen facility. This is demonstrated by the L_{A10} measurement at 74 dB(A) and L_{AF90} at 47 dB(A). An air handling unit or fan was also audible at this location during the evening measurement. It was originating off-site, most likely at an adjacent galvanising works, but the exact location could not be determined.

At N-2, the L_{Aeq} was 66 dB(A) and the noise was dominated by traffic on the adjacent Merrywell Industrial Estate access road, note the L_{AF10} level of 69 dB(A). Background noise was attributable to the operations in the waste handling building on the Oxigen site. The main on-site noise source measured at this location was the waste sorting, particularly the trommel. Distant traffic also contributed to the background noise at this location.

N-3 was located on the southern boundary. Noise here was again attributable to the adjacent Ballymount Road Lower, with an L_{Aeq} of 69 dB(A) and an L_{AF10} of 74 dB(A). Some on-site noise contributed, including material handling and reversing sirens within the southern building on the site. The background noise was attributable to distant traffic. Operations from the main (northern) building were not audible.

After the site had shutdown another set of night-time noise measurements were taken along the boundary locations. The L_{Aeq} noise levels at all boundary locations were lower

than during the day, save for N-4. The increase in noise at N-4 is attributed to an increase in activity at the DHL depot during the night-time noise monitoring event in comparison to the evening event. The L_{Aeq} levels for all boundary locations remain high, ranging from 60 – 63 dB(A), and similarly the daytime measurements remain dominated by nearby and distant traffic levels. The background (L_{AF90}) levels were on average 1 to 2 dB lower during the night monitoring, save again for N-4. The higher levels at N-4 were due to increased activity at the DHL facility.

4.5. On-site Location

During daytime monitoring N-5 had an L_{Aeq} of 53 dB(A). The noise at this location was dominated by traffic on the nearby Turnpike Road and Ballymount Road Lower. The impact of traffic noise was lessened by the presence of earth bunds between the roadway and the measurement location. Site operations, including material recovery plant, vehicle movements and in particular a street sweeper were significant contributors to the noise at this location.

The facility did not operate during the last night measurement, however, the noise levels on-site did not drop significantly from the previous two measurements at this location. Road traffic noise maintained the L_{Aeq} at 53 dB(A). However the background level (L_{AF90}) did drop significantly from 48 dB(A) in the late evening measurement with the site operating to 42 dB(A) at night as a result of the cessation of operations at the site.

4.6. Assessment of Tonal Components

All measurements were subject to a one-third octave band analysis to identify tonal components within the noise measured. No tonal components were recorded during the measurements at N-5 on-site during site operations. A number of tonal noises were recorded at other locations, and are attributed to off-site sounds.

4.7. Traffic Survey

In conjunction with the noise monitoring, a night and day time traffic count survey was carried out at the noise sensitive location, (N-1) adjacent to the Turnpike Road. All vehicular movements on the road during the measurements were counted.

Table 4.1 Traffic Count Data at N-1

	Cars and Light Vehicles	Heavy Commercial Vehicles	Percent HCV
Rate	Veh/hr	Veh/hr	%
Daytime 1 (17:20)	258	16	5.8 %
Daytime 2 (21:00)	236	16	6.3 %
Night (11:30)	152	8	5 %

The NSL is located within an industrial area adjacent to the busy Ballymount Road Lower and close to the M50 motorway and the volume of traffic counted during the survey reflects this fact.

4.8. Assessment of Potential Impact of 24-Hour Operations on the NSL

The results of the noise measurements carried out show that the facility is located in a high noise environment. Traffic noise both during the day and night was the dominant source of noise at all of the measurement locations.

If typical NRA diurnal traffic distribution is applied to Turnpike Road, then the likely minimum traffic level will occur at 04:00hrs and will still result in a traffic related noise level of approximately 54 dB(A). The contribution of operations at the site would be much lower than this, as the EPA licence required night-time noise levels to be a maximum of 45 dB(A) at the boundary of the site.

If the external traffic noise was excluded, current day-time operations at the site are likely to meet the required 55 dB(A) ($L_{Aeq,30-min}$) limit set in the Waste Licence. Night-time operations may need to be limited to indoor processing and handling of waste in order to meet the night-time 45 dB(A) ($L_{Aeq,30-min}$) limit. With the building doors closed during night operations, save for access of machinery, and the movement of materials in the marshalling yard (e.g. tipping glass) limited to current working hours, the site should be capable of meeting the EPA night-time noise limits.

5. CONCLUSIONS

The assessment carried out at the site examined the existing noise generated at the site and the background noise in the region. The following conclusions have been reached;

- The site is located in a high noise area, where traffic noise dominates.
- The nearest noise sensitive location is subject to significant traffic noise from both local traffic on the Turnpike Road, and from distant traffic on the surrounding road network.
- The operations at the facility do not contribute significantly to the noise levels at the noise sensitive location. It is considered that the site was operating within the noise conditions requirements set out by the EPA Waste Licence during the measurements.
- The site is currently not a significant noise source in the region and is not having a significant negative impact on the noise environment.
- Considering the results of the noise monitoring and the existing ambient noise levels, extending the operational hours of the facility is not likely to have a perceptible negative impact on the nearest noise sensitive location, subject to appropriate management measures, which may include
 - Maintaining doors of the facility closed during the night-time operations, particularly on the northern site of the building
 - Curtailing operations (e.g. glass tipping etc.) in the marshalling yard on the north of the building during the night period.

APPENDIX 1 – NOISE MONITORING LOCATIONS MAP

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