

Greater Dublin Drainage

Alternative Sites Assessment - Phase Two Sites Assessment and Route Selection Report

Noise and Vibration

May 2012

Executive Summary

Noise and Vibration

A preliminary assessment of the potential Noise and Vibration impacts associated with locating the proposed Regional WwTP on the nine shortlisted land parcels and their associated sites was undertaken in order to aid in the design process and the emergence of a preferred location for the Regional WwTP. The assessment takes cognisance of the proximity of sensitive receptors.

13 Noise and Vibration

13.1 Introduction

This preliminary assessment will establish the relative magnitude of potential noise and vibration impact to sensitive receptors attributable to each of the nine shortlisted land parcels and their associated sites. This study has been compiled in the form of a desk top study comprising Industry Guidance documents, digital mapping, geo-directory data and GIS systems

13.2 Methodology

The potential for noise and vibration impact associated with the proposed WWTW at each of the nine candidate land parcels has been assessed by use of the National Roads Authority document entitled: “*Guidance for the treatment of Noise and Vibration in National Road Schemes*”. This guidance is applicable as it pertains to the construction of linear infrastructure such as the pipelines feeding the proposed locations and is amenable to the use of house count/receptor data as gained from the geo-directory and GIS data used herein.

The guidance document states that all receptors within 300m of each route option should be identified and put into one of four "bands". These bands are defined by their distance to either side of the centre line of each route option. Band 1 is from 0 to 50m of the centre line, Band 2 is from 50 to 100m, Band 3 is from 100 to 200m and Band 4 is from 200 to 300m. For this purpose, a receptor is defined as being any dwelling house, hotel, hostel, health building, educational establishment, places of worship, entertainment venue or any other facility or area of high amenity which benefits from, or requires the absence of, high noise levels.

The total number of receptors in each band is multiplied by an arbitrary rating factor. The rating factor is 4 for Band 1, 3 for Band 2, 2 for Band 3 and 1 for Band 4. The resultant values are summed to give a single number for each route option, termed the Potential Impact Rating (PIR). The PIR values may be used to assess the potential impact of each route option, the larger the PIR the greater the potential impact.

In terms of the land parcels assessment there are no receptors within 300m of the boundary as this was a constraints stage criterion. As such, in order to classify each of the potential WwTP sites this methodology has been expanded out to 500m. Receptors in the 300-400m band have a rating factor of 2, while those in the 400-500m band have a rating factor of 1.

13.2.1 Desktop Study

The desktop study used the data as described above to calculate PIR rating for each of the nine shortlisted land parcels and their associated sites. These were then ranked as having the potential for a Low, Medium or High noise and vibration impact for both the construction and operational stages of the proposed scheme.

13.3 Existing Environment

The existing environment at each of the nine shortlisted land parcels and their associated sites is largely characterised by the constraints criteria used to establish the sites in the first instance. There are no sensitive receptors within 300m of any of the

nine sites. Some are predominantly in rural locations while others are close to major roads, and some are under the flight paths of principal runways of Dublin Airport.

13.4 Predicted Impacts

Noise and vibration impacts will occur during both the construction and operational phases of the proposed scheme.

13.4.1 Construction Phase

In the construction phase the noise and vibration impacts will be due to earth moving, rock breaking and general civil and structural engineering works. These will require to be planned and managed so as to minimise potential noise and vibration impact to the closest sensitive receptors. The nature of this sensitivity can be seen from the relative PIR ratings received by each of the nine shortlisted land parcels and associated sites assessed in Table 13.0 and Table 13.1 respectively.

13.4.2 Operational Phase

During the operational phase the potential for noise and vibration impact should be more or less equal for all of nine of the proposed WwTP sites as the operating facility will be required to meet standard noise and vibration emission criteria at the closest sensitive receptor, regardless of the proximity of that receptor.

13.5 Evaluation

13.5.1 Evaluation of Land Parcels

See Table 13.0 below.

13.5.2 Evaluation of Sites

See Table 13.1 below.

Table 13.0: Land Parcels Assessment

Ref	Environmental Criteria	Annsbrook	Baldurgan	Clonshagh	Cookstown	Cloghran	Newtowncorduff	Rathartan	Saucerstown	Tyrrelstown Little
13.1	Potential for Construction phase noise impact at Sensitive receptors	70 dwellings (PIR) within 0.5km	29 dwellings (PIR) within 0.5km	58 dwellings (PIR) within 0.5km	82 dwellings (PIR) within 0.5km	142 dwellings (PIR) within 0.5km	54 dwellings (PIR) within 0.5km	170 dwellings (PIR) within 0.5km	72 dwellings (PIR) within 0.5km	72 dwellings (PIR) within 0.5km
13.2	Potential for Operational phase noise impact at Sensitive receptors	Facility shall reach 55 db(A) Daytime and 45 db(A) night at closest receptor	Facility shall reach 55 db(A) Daytime and 45 db(A) night at closest receptor	Facility shall reach 55 db(A) Daytime and 45 db(A) night at closest receptor	Facility shall reach 55 db(A) Daytime and 45 db(A) night at closest receptor	Facility shall reach 55 db(A) Daytime and 45 db(A) night at closest receptor	Facility shall reach 55 db(A) Daytime and 45 db(A) night at closest receptor	Facility shall reach 55 db(A) Daytime and 45 db(A) night at closest receptor	Facility shall reach 55 db(A) Daytime and 45 db(A) night at closest receptor	Facility shall reach 55 db(A) Daytime and 45 db(A) night at closest receptor
13.3	Existing Ambient Noise Climate in the Area (significant noise sources)	Relatively rural climate, within 1km of the M1 Motorway	Relatively rural farmland area	Close to M50 and M1 Motorways, under mina runway flight path for Dublin Airport.	Relatively rural farmland area	Borders M1 Motorway, under projected flight pat of planned parallel runway at Dublin Airport.	Borders M1 Motorway and N1 National Primary road.	Borders DART line	Rural Area, no significant noise sources.	Rural area, borders DART line
13.4	Construction Phase Impact rating	slight	imperceptible	slight	slight	Moderate	slight	Moderate	slight	slight
13.5	Operational Phase Impact rating	imperceptible	slight	imperceptible	slight	imperceptible	imperceptible	imperceptible	slight	imperceptible

Table 13.1: Sites Assessment

Ref	Environmental Criteria	Annsbrook	Baldurgan	Clonshagh	Cookstown	Cloghran	Newtowncorduff	Rathartan	Saucerstown	Tyrrelstown Little
13.1	Potential for Construction phase noise impact at Sensitive receptors	26 dwellings (PIR) within 0.5km	6 dwelling (PIR) within 0.5km	37 dwellings (PIR) within 0.5km	7 dwellings (PIR) within 0.5km	15 dwellings (PIR) within 0.5km	40 dwellings (PIR) within 0.5km	22 dwellings (PIR) within 0.5km	57 dwellings (PIR) within 0.5km	8 dwellings (PIR) within 0.5km
13.2	Potential for Operational phase noise impact at Sensitive receptors	Facility shall reach 55 db(A) Daytime and 45 db(A) night at closest receptor	Facility shall reach 55 db(A) Daytime and 45 db(A) night at closest receptor	Facility shall reach 55 db(A) Daytime and 45 db(A) night at closest receptor	Facility shall reach 55 db(A) Daytime and 45 db(A) night at closest receptor	Facility shall reach 55 db(A) Daytime and 45 db(A) night at closest receptor	Facility shall reach 55 db(A) Daytime and 45 db(A) night at closest receptor	Facility shall reach 55 db(A) Daytime and 45 db(A) night at closest receptor	Facility shall reach 55 db(A) Daytime and 45 db(A) night at closest receptor	Facility shall reach 55 db(A) Daytime and 45 db(A) night at closest receptor
13.3	Existing Ambient Noise Climate in the Area (significant noise sources)	Relatively rural climate, within 1km of the M1 Motorway	Relatively rural farmland area	Close to M50 and M1 Motorways, under main runway flight path for Dublin Airport.	Relatively rural farmland area	Borders M1 Motorway, under projected flight pat of planned parallel runway at Dublin Airport.	Borders M1 Motorway and N1 National Primary road.	Borders DART line	Rural Area, no significant noise sources.	Rural area, borders DART line
13.4	Construction Phase Impact rating	slight	imperceptible	slight	imperceptible	slight	slight	slight	slight	imperceptible
13.5	Operational Phase Impact rating	slight	imperceptible	slight	imperceptible	slight	slight	slight	slight	imperceptible

13.6 Mitigation Measures

With Regard to mitigation measures, separate criteria will apply to the construction and operational phases of the proposed scheme.

13.6.1 Construction Phase Noise Mitigation

With regard to construction activities, all plant items used during the construction phase should comply with standards outlined in 'European Communities (Construction Plant and Equipment) (Permissible Noise Levels) Regulations, 1998.

Reference should be made to BS5228: Noise control on construction and open sites, which offers detailed guidance on the control of noise from construction activities.

Standard mitigation measures are described in the NRA's Guidelines for the Treatment of Air Quality during the Planning and Construction of National Road Schemes (National Roads Authority, 2011). Mitigation measures should be incorporated into the Construction Environmental Management Plan (CEMP) which will be developed during the construction stage of the project.

13.6.2 Construction Phase Vibration Mitigation

Any construction works that have the potential to cause vibration at sensitive receptors will be carried out in accordance with the limit values as set out in Table 13.3 below. The design separation of a minimum of 300m from the land parcel boundary to the closest receptor will serve to minimise any potential vibration impact.

Table 13.3 Allowable vibration during construction in order to minimise the risk of building damage

Allowable vibration velocity (Peak Particle Velocity) at the closest part of any sensitive property to the source of vibration, at a frequency of		
Less than 10Hz	10 to 50Hz	50 to 100Hz and above
8mm/s	12.5mm/s	20mm/s

13.6.3 Operational Phase Mitigation

During the operational phase the scheme will be required to meet standard limits for noise intended to protect the ambient noise climate and avoid potential significant noise impact to sensitive receptors. This would typically comprise limits of 55db (a) for daytime operation and 45dB (A) for night time operation. Design of the facility to these specifications should negate the need for further proprietary noise mitigation. There is no vibration impact to sensitive receptors anticipated for the operational phase of the proposed scheme.