

VIRIDOR

**Proposed Development of a Waste
Treatment Plant, Lostock Gralam**

**Appendix 12.1 Noise Impact
Assessment**

September 2009

CONTENTS

1. Introduction.....	1
2. Methodology.....	2
3. Noise Survey.....	4
4. Potential Sources of Noise.....	8
5. Mitigation Measures.....	13
6. Prediction Calculations for the WTP.....	14
7. Noise Impact Assessment.....	22
8. Conclusions.....	28

APPENDICES

Appendix A	BS4142 Assessment Criteria
Appendix B	Noise Monitoring Results
Appendix C	Noise Prediction Calculations

DRAWINGS

LE10104/EIA 003B	Proposed Site Layout
LE10104/EIA 018A	Noise Monitoring Locations

1. INTRODUCTION

- 1.1.1 Viridor are seeking planning consent for the development of a Waste Treatment Plant at Lostock Gralam, near Northwich, Cheshire.
- 1.1.2 Viridor have commissioned Wardell Armstrong LLP to prepare a noise impact assessment of the development proposals as an appendix to the Environmental Statement. This report should therefore be read in conjunction with the Environmental Statement (Volume 2) which will be submitted as part of a planning application together with a Supporting Statement (Volume 1) and a Design and Access Statement (Volume 3).
- 1.1.3 The proposed scheme considered as part of this planning application is the development of a Waste Treatment Plant (WTP), incorporating mechanical and biological treatment (MBT) processes. The WTP will be constructed to treat kerbside collected and Household Waste Recycling Centre (HWRC) derived residual municipal waste from across West Cheshire and Chester, and East Cheshire areas.
- 1.1.4 Details of the proposed development are described in greater detail in Chapter 4 of the Environmental Statement, Volume 2. Chapter 12 of the Environmental Statement assesses the potential noise impacts of the development proposals and considers both the construction phase and operational phases.
- 1.1.5 This report comprises a noise assessment which considers the potential impacts arising from the proposed WTP at Lostock Gralam. It provides information on the current noise climate and assesses the operational phase impacts of the proposed development at existing and proposed sensitive receptor locations in the immediate vicinity of the site. Where necessary, mitigation measures are assessed and recommended as part of the final design.

2. METHODOLOGY

2.1 Consultation and Scope of Assessment

2.1.1 Prior to and during the noise assessment carried out by Wardell Armstrong LLP, the potential impacts of the proposed facilities at existing receptor locations and general principles of the assessment methodology were discussed with Kate Davis of the Environmental Health Department of Cheshire West and Chester Council (CWCC).

2.1.2 The scope of works included in this assessment is as follows:

Noise Survey:

2.1.3 As part of this assessment, Wardell Armstrong LLP has carried out an attended noise survey to assess the current ambient and background noise levels at representative existing and proposed residential receptor locations. The noise survey is discussed in detail in Section 3 of this report.

Noise Prediction Calculations and Mitigation Measures:

2.1.4 Calculations have been carried out to predict the noise levels likely to be generated by the operational activities of the WTP, including the noise from the associated vehicle movements and loading/unloading of rail wagons at the site, at residential receptor locations. The calculations have utilised noise measurement information obtained from technology providers and plant providers. The potential sources of noise and measurement information associated with the WTP are detailed in Section 4 of this report.

2.1.5 To reduce the potential noise impact of the operation of the development at existing receptor locations, mitigation measures will be implemented. These measures are discussed in greater detail in Section 5 of this report.

2.1.6 The noise prediction calculations take into account the proposed mitigation measures which are to be implemented. The calculations are shown in full in Appendix C and discussed in greater detail in Section 6 of this report.

Noise Impact Assessment – Existing Residential Receptors:

2.1.7 The potential impact of the predicted noise levels has been based upon the British Standard 4142:1997 “Method for rating industrial noise affecting mixed residential and industrial areas” (BS4142). The Standard provides a method for

determining the level of a noise of an industrial nature, together with procedures for assessing whether the noise in question is likely to cause a disturbance to persons living in the vicinity of the site.

- 2.1.8 Response to noise is subjective and affected by many factors. In general, the potential for disturbance by a particular noise depends on the degree by which it exceeds the existing background noise level, its absolute level, time of day etc, as well as local attitudes to the premises and the nature of the neighbourhood. BS4142 assesses the potential impact of a particular noise by comparing it with the background noise level, whilst providing an appropriate allowance for acoustic features present in the noise (e.g. hum, whine, bang or clatter).
- 2.1.9 BS4142 recommends that where a specific noise contains discrete impulses and/or audible tonal qualities, then a 5 dB correction is to be added to the specific noise level of the source to provide a rating level. The greater the difference between the rating level and the background noise level, the greater the potential for disturbance.
- 2.1.10 BS4142 describes the potential for disturbance in terms of the likelihood of the noise giving rise to complaints from persons living in the vicinity. The assessment criteria are presented in Appendix A.
- 2.1.11 The assessment of the potential impact of the predicted noise levels of the operational phase of the WTP at residential receptors, has been based on BS4142 procedures. The predicted noise levels of the operational phase of the development have been assessed against the average daytime and night-time background noise levels, measured at each of the monitoring locations during the noise survey.
- 2.1.12 The BS4142 noise impact assessment for existing residential receptors is discussed in greater detail in Section 7 of this assessment.

3. NOISE SURVEY

3.1 Noise Receptor Locations

- 3.1.1 The development site is located off Griffiths Road, Lostock Gralam, approximately 2km east of Northwich town centre. The proposed WTP will be constructed in an industrial setting consisting of existing and former chemical works close to the A559 (Manchester Road). Access to the site is located off the A530 Griffiths Road, via a private estate road shared with the other uses of the chemical complex. The site location is shown on Drawing Number LE10104/EIA 001A, included in the Drawings section of the Environmental Statement, Volume 2.
- 3.1.2 Existing sensitive receptors nearest to the proposed development include residential properties to the north, south and west of the site. In addition to the existing residential receptors, we understand that CWCC have granted planning permission for a residential development to the southwest of the site. For the purpose of this assessment this is referred to as the Wade Works residential development.
- 3.1.3 Details of the residential receptor locations, including distances from the site application boundary, the proposed WTP and associated operational activities, are set out in Table 1. The locations of the receptors are also shown on Drawing Number LE10104/EIA018A.

Table 1: Existing Noise Receptor Locations (Approximate Figures in Metres)				
Receptor	Distance from the Site Boundary	Distance from the WTP and HWRC Residual Waste Processing Facility	Distance from Vehicle Movements	Distance from Loading / Unloading of Rail Wagons
1. Manchester Road / Victoria Street / Boundary Street	275	255	320 to 415	235 to 325
2. Farms Road / St Johns Close	540	550	560 to 690	675 to 715
3. James Street	540	545	650 to 725	620 to 775
4. Bowden Drive	570	595	660 to 755	570 to 790

5. St Ann Street / Cranage Lane	240	250	270 to 390	200 to 375
6. Proposed Wade Works Residential Development	275	290	380 to 450	320 to 470

3.2 Background Noise Survey

3.2.1 The hours of operation for the proposed WTP are as follows:

- The acceptance of waste at the facility will take place between 0700 and 1930 hours, seven days a week.
- The mechanical treatment and biodrying of waste will take place 24 hours a day, seven days a week.
- The loading/unloading of rail wagons with containers of SRF (using the gantry crane) will take place between 0700 and 1930 hours, seven days a week.
- The loading of road going vehicles with recyclates/untreatable waste to be transported off site, will take place between 0700 and 1930 hours, seven days a week.

3.2.2 To provide information representative of the operational periods, Wardell Armstrong LLP carried out an attended noise survey during the following periods:

- Between 1230 to 1700 hours, on the 3rd June 2009.
- Between 2245 to 0645 hours, on the 4th and 5th June 2009.
- Between 0700 to 1230 hours, on the 16th June 2009.

3.2.3 Background noise measurements were taken at six monitoring locations, considered to be representative of the existing and proposed residential receptors in the immediate vicinity of the proposed development. The monitoring locations are as follows, and are shown on Drawing Number LE10104/EIA 018A:

- Monitoring Location 1: Approximately 280m to the northeast of the site, considered to be representative of the existing receptors off Manchester Road, on Victoria Street/Boundary Street.
- Monitoring Location 2: Approximately 620m to the south of the site, considered to be representative of the existing receptors on Farm Road/St John's Close.
- Monitoring Location 3: Approximately 490m to the southwest of the site, considered to be representative of the existing receptors on James Street.
- Monitoring Location 4: Approximately 550m to the west of the site, considered to be representative of the existing receptors on Bowden Street.

- Monitoring Location 5: Approximately 250m to the north of the site, considered to be representative of the existing receptors off Manchester Road, on Ann Street and Cranage Lane.
- Monitoring Location 6: Approximately 330m to the southwest of the site, considered to be representative of the proposed residential receptors of the Wade Works development.

3.2.4 The A-weighted¹ L_{90s} ² were recorded for each monitoring period, to comply with the requirements of BS4142. The A-weighted L_{eqs} ³ together with the maximum and minimum sound pressure levels were also recorded to provide additional information.

3.2.5 Noise measurements were taken typically over 15 minute periods during the daytime and night-time. Measurements were taken using a precision grade, integrating sound level meter mounted vertically on a tripod 1.2 metres above the ground and more than 3.5 metres from any other reflecting surface. The sound level meter was calibrated both before, and on completion of, the noise survey.

3.2.6 For the purpose of this assessment daytime hours are taken to be 0700 to 2300 hours and night-time hours are 2300 to 0700 hours. The background noise and ambient measurements taken at each monitoring location have been arithmetically averaged to determine the average daytime and night-time noise levels for each receptor.

3.2.7 The daytime and night-time background and ambient noise levels, used in this assessment are presented in Table 2. The measured noise levels are set out in full in Appendix B.

¹ A' Weighting An electronic filter in a sound level meter which mimics the human ear's response to sounds at different frequencies under defined conditions

² L_{90} The noise level which is exceeded for 90% of the measurement period.

³ L_{eqs} Equivalent continuous noise level; the steady sound pressure which contains an equivalent quantity of sound energy as the time-varying sound pressure levels.

Monitoring Location	Averaged measurements used for assessment of 0700 to 2300 hours		Averaged measurements used for assessment of 2300 to 0700 hours	
	L _{A90} dB(A)	L _{Aeq} dB(A)	L _{A90} dB(A)	L _{A90} dB(A)
1. Manchester Road / Victoria Street / Boundary Street	46.3	53.8	42.7	47.6
2. Farms Road / St Johns Close	41.8	47.6	42.9	49.5
3. James Street	47.7	39.4	39.8	44.8
4. Bowden Drive	38.9	47.4	39.1	42.4
5. St Ann Street / Cranage Lane	50.6	64.2	41.5	58.5
6. Proposed Wade Works Residential Development	38.9	46.6	41.7	49.5

3.2.8 Attended monitoring was carried out throughout the noise survey to allow observations and detailed notes to be made of the significant noise sources which contributed to each of the measured noise levels. The major noise sources identified at the monitoring locations were as follows:

Road Traffic: Noise from vehicles on the local road network was audible throughout the noise survey at each of the monitoring locations.

Industrial Noise: Operational noise from industrial premises of the chemical complex to the east of the site was audible at all of the monitoring locations throughout the survey.

Railway Noise: Trains travelling along the railway line to the north of the proposed development were occasionally audible at monitoring locations 2, 5 and 6, during the noise survey.

Aircraft: The noise from aircraft was occasionally audible during the survey, at each of the monitoring locations.

3.2.9 In summary, the average ambient daytime noise levels at the monitoring locations ranged between 46.6dB L_{Aeq 15minutes} and 64.2dB L_{Aeq 15minutes}. The daytime noise levels are predominantly influenced by road traffic on the local road network. During the night-time the noise levels fell and the average noise levels ranged between 42.4dB L_{Aeq 15minutes} and 58.5dB L_{Aeq 15minutes}.

4. POTENTIAL SOURCES OF NOISE

4.1 Mechanical and Biological Treatment Facility (MBT)

4.1.1 The MBT process which will take place at the proposed WTP will involve the following stages:

- Waste Reception.
- Mechanical Treatment and
- Biodrying.

Waste Reception

4.1.2 Refuse Collection Vehicles (RCVs) and Heavy Goods Vehicles (HGVs) will weigh in at the weighbridge and progress to the waste reception hall.

4.1.3 Waste suitable for treatment from the reception hall of the main MBT will be loaded via mechanical grabs into loading hoppers. Waste will pass from the loading hoppers to the shredders onto a conveyor belt system which will then transport the material into the mechanical treatment area.

4.1.4 Residual waste, unsuitable for treatment, will be compacted into containers and transported off site to final disposal.

Mechanical Treatment

4.1.5 In the mechanical treatment area the waste will undergo a series of physical treatments to separate fractions of the waste suitable for recycling, energy recovery, disposal and the organic fraction for further biological treatment.

Biodrying

4.1.6 During the biodrying phase the organic fraction of waste from the mechanical treatment phase is fed into one of eleven biodrying tunnels. Air is introduced into the tunnels promoting aerobic conditions and the waste begins to self heat via the action of micro-organisms. It is this self heating which helps to remove moisture whilst also minimising the need for additional heating within the biodrying tunnels.

4.1.7 The bio-dried material discharged from the tunnels will be conveyed to the refining plant. The inert element of the material, which will consist of grit, sand

and glass, will be removed. These materials are all readily recoverable and suitable for the manufacture of secondary aggregate. The bio-dried organic fraction is suitable for use as a component of solid recovered fuel (SRF) and this is combined with the material from the HWRC waste treatment hall to form one homogenous SRF.

Auxiliary Functions

4.1.8 In addition to the processes taking place in each stage of the MBT process, a number of auxiliary functions will take place at the WTP, which are relevant to this noise assessment. They include:

- External plant located to the south of the site, including the air treatment plant.
- Loading of the final product / waste to be transported off site.

4.2 Potential Sources of Noise Associated with the MBT Process:

4.2.1 When operational, plant associated with all of the stages of the MBT process may generate noise.

4.2.2 Noise level information for the proposed operational plant, associated with the mechanical and biodrying process, has been provided by the manufacturers of plant.

4.2.3 A summary of the noise level information for plant associated with the main stages of the MBT process and auxiliary functions of the WTP are detailed in Table 3.

Table 3: Noise Level Information of Plant associated with the Mechanical Treatment and Drying Processes of the WTP		
Stage of MBT Process/Auxiliary Function		Noise Level Information (dB(A))
Waste Reception Hall (Between 0700 and 1930 hours):	Feeding Conveyor (to MSP) x 2 Shredder x 2 Refuse Collection Vehicle (RCV) / Heavy Goods Vehicle (HGV) Unloading Loading Shovel	69dB(A) 88dB(A) 112dB(A) (L _{WA} ⁴) 108dB(A) (L _{WA})

⁴ L_{WA} Sound power level, sound power measured on a decibel scale.

Waste Reception Hall (Between 1930 and 0700hours):	Feeding Conveyor (to MSP) x 2 Shredder x 2 Loading Shovel	69dB(A) 88dB(A) 108dB(A) (L _{WA})
Mechanical Separation Process:	Trommel Screen x 5 Windshifter & Combiseparator x 4 Fe Separator x 5 Non-Fe Separator x 5 Windshifter x 2 Optical Separator Stretch Deck Screen Densimetric Table Conveyors Compactor Station	87dB(A) 101dB(A) (L _{WA}) 84dB(A) 85dB(A) 88dB(A) 95dB(A) 85dB(A) 95dB(A) 69dB(A) 90dB(A)
Biodrying Hall	RDF loading conveyor Tunnel filling x 2 Automatic Discharge Device Bio-drying Area Internal Conveyors	80 dB(A) 78.5 dB(A) 84.5 dB(A) 87 dB(A) 78.3 dB(A)
External Plant	Biofilter Conveyor from Bio Tunnels to Mechanical Separation Process Building Conveyor from HWRC to Waste Reception Hall	88.8dB(A) 67.9 dB(A) 69dB(A)

*Please note plant terminology is taken directly from information provided by manufacturers.

4.2.4 The WTP mechanical treatment processes and biodrying will operate 24 hours a day. The acceptance of waste will take place between 0700 and 1930 hours.

4.3 HWRC Residual Waste Processing Facility

4.3.1 HWRC collected residual waste will be received in a smaller dedicated hall. Bulky recyclables materials and unsuitable materials will be separated out. The remaining material will be shredded and fed into the HWRC waste processing plant.

4.3.2 The treatment process of the HWRC residual waste will remove ferrous metals and aggregate with the remainder used as SRF. The process will be entirely mechanical.

4.3.3 A summary of the noise level information for plant associated with the HWRC waste processing building are detailed in Table 4.

Table 4: Noise Level Information of Plant associated with the HWRC Waste Processing Facility		
HWRC Waste Treatment	Associated Plant	Noise Level Information (dB(A))
HWRC Residual Waste Processing Facility (Between 0700 and 1930 hours):	Heavy Duty Shredder Trommel Screen x 2 Fe Separator x 2 Windshifter & Combiseparator Heavy Goods Vehicle (HGV) Unloading Loading Shovel	108dB(A) (L _{WA}) 87dB(A) 84dB(A) 101dB(A) (L _{WA}) 112dB(A) (L _{WA}) 108dB(A) (L _{WA})
HWRC Residual Waste Processing Facility (Between 1930 and 0700hours):	Heavy Duty Shredder Trommel Screen x 2 Fe Separator x 2 Windshifter & Combiseparator Loading Shovel	108dB(A) (L _{WA}) 87dB(A) 84dB(A) 101dB(A) (L _{WA}) 108dB(A) (L _{WA})

4.4 On-Site Vehicle Movements

4.4.1 Vehicle movements on the site have the potential to increase the ambient noise levels at existing receptors located in the immediate vicinity of the site. These vehicle movements include the arrival of waste, together with the distribution of recyclates and untreatable waste from the WTP.

4.4.2 The acceptance of waste at the WTP, together with the distribution of materials via road going vehicles, i.e. RCVs and HGVs, will take place between the hours of 0700 to 1930, seven days a week.

4.5 Rail Movements and Loading/Unloading of Freight Trains

4.5.1 The SRF produced at the site will be transported directly to Runcorn by rail.

4.5.2 Railway sidings plus a gantry crane will be constructed within the application boundary in the northern part of the site for the purpose of loading and unloading the waste containers on and off the freight trains.

- 4.5.3 Based on information provided by Viridor, one train will move to and from the site each day, during the daytime period. At this stage, it is anticipated that a train will arrive at approximately 1900 hours and will depart at approximately 1430 hours, the following day. The SRF containers will be moved on and off the freight train by a gantry crane between 0700 and 1400 hours.
- 4.5.4 The SRF containers will be moved to and from the mechanical treatment area of the WTP building by a fork lift. These activities will take place between 0700 and 2300 hours.

5. MITIGATION MEASURES

5.1.1 To reduce the potential impact of noise levels generated by the operation of the development at existing and proposed receptor locations in the immediate vicinity of the site, measures will be incorporated into the design of the proposed development, and best working practice will be implemented.

5.1.2 The following measures will be put in place to ensure that noise associated with the WTP is minimised:

- The construction materials of the northern facade of the waste reception hall and the western façade of the mechanical separation process building will provide a level of attenuation of no less than 30dB(A).
- The construction materials of the northern facade of the mechanical separation process building of the WTP, will provide a level of attenuation of no less than 34dB(A).
- The construction materials of the remaining facades of the buildings proposed to house the WTP facilities will provide a level of attenuation of no less than 25dB(A).
- A 2.4m high acoustic fence will be constructed immediately adjacent to the northern boundary of the site, i.e. adjacent to the railway sidings.
- All plant and vehicles used will be serviced regularly to ensure they are maintained in good working order. The plant will also be fitted with effective silencers;
- The amount of machinery used will be minimised where possible;
- The operational hours of each of the facilities will be restricted to those specified in the Supporting Statement (Volume 1); and
- Site staff will be aware that they are working in close proximity to residential receptors and avoid all unnecessary noise due to the misuse of tools and equipment, unnecessary shouting and radios.

6. PREDICTION CALCULATIONS FOR THE WTP

6.1 Introduction

6.1.1 The potential noise levels generated by the operation of the proposed WTP will be affected by the quantities of materials being handled, the acoustic insulation properties of the facility building (where plant is located within a building), the distance of each noise source from the receptors, any intervening barriers and any noise mitigation measures implemented (as detailed in Section 5 of this report).

6.1.2 Prediction calculations have been carried out to determine the noise levels likely to be generated by the operation of the WTP together with on-site vehicle movements and the loading/unloading of rail wagons, at each of the six identified receptor locations.

6.2 The Waste Treatment Plant (WTP)

6.2.1 Prediction calculations, as detailed in Appendix C, have been carried out to determine the noise levels likely to be generated by the operation of the WTP including the HWRC residual waste processing facility, at receptor locations. Noise predictions are based on archive measurement information of similar plant information provided by the MBT technology provider and manufacturers of the plant, as detailed in Tables 3 & 4.

6.2.2 The following stages of the MBT process of the WTP will take place within the following buildings:

- Waste Reception will take place within the area in the east of the WTP building.
- Mechanical separation and treatment will take place within the area in the west of the WTP building.
- The biodrying process air clean up will take place within the southern area of the WTP building.

6.2.3 The waste reception and mechanical separation of the HWRC residual waste will take place within a building in the southeast of the site, adjacent to the biofilters.

6.2.4 It is assumed that each of the treatment areas will act as a reverberant room, and the prediction calculations have taken this into consideration. The reverberant sound power levels, used within the assessment are detailed in Table 5.

Table 5: Reverberant Sound Pressure Levels	
Stage of Treatment Process	Reverberant Sound Pressure Level (dB(A))
Waste Reception: Daytime (0700 to 1930 hours)	96.5
Waste Reception: Daytime (1930 to 2300 hours) and Night-time (2300 to 0600 hours)	93.9
Mechanical Separation and Treatment	102.6
Biodrying Tunnels	90.4
HWRC Residual Waste Processing Facility Daytime (0700 to 1930 hours)	98.7
HWRC Residual Waste Processing Facility: Daytime (1930 to 2300 hours)	97.1
HWRC Residual Waste Processing Facility: Night-time (2300 to 0700 hours)	99.0

* Based on the sound power levels provided by the Technology Providers as detailed in Tables 3 & 4.

6.2.5 The MBT plant and HWRC Residual Waste processing facility will be purpose-built buildings, designed specifically to contain the noise generated by the operational activities. For the purpose of this assessment, it has been taken that the southern facades of the building will attenuate as follows:

- The construction materials of the northern facade of the waste reception hall and the western façade of the mechanical separation process building will provide a level of attenuation of no less than 30dB(A).
- The construction materials of the northern facade of the mechanical separation process building of the WTP, will provide a level of attenuation of no less than 34dB(A).
- The construction materials of the remaining facades of the buildings proposed to house the WTP facilities will provide a level of attenuation of no less than 25dB(A).

- 6.2.6 To provide a robust assessment, it is considered that the construction materials of the buildings will provide a low level of acoustic absorption. The absorption coefficient value used in the prediction calculations is 0.02.
- 6.2.7 The proposed site layout, as detailed in Drawing Number LE10104/EIA 003B indicates that existing intervening barriers will screen some of the receptors from components of the WTP facility. To be robust, screening provided by the proposed intervening barriers of the Bedminster site located immediately to the west of the proposed site, together with the residential properties of the Wade Works development have not been included in the prediction calculations.
- 6.2.8 The results of the prediction calculations, for typical daytime and night-time operations, are shown in Table 6.

Table 6: Predicted Noise Levels Generated by the Operations of the WTP at Receptor Locations			
Receptor	Predicted Daytime Noise Levels (0700 to 1930 hours - Figures in dB LAeq 1Hour)	Predicted Daytime Noise Levels (1930 to 2300 hours - Figures in dB LAeq 1 hour)	Night-time Noise Levels (2300 to 0700 hours – Figures in dB LAeq 5 minutes)
1. Manchester Road/Victoria Street/Boundary Street	35.7	35.2	35.2
2. Farms Road/St Johns Close	31.3	30.3	30.8
3. James Street	32.7	32.0	32.8
4. Bowden Drive	31.3	30.7	31.4
5. St Ann Street/Cranage Lane	35.2	35.1	35.1
6. Proposed Wade Works Residential Development	37.2	36.5	37.2

6.3 On-Site Vehicle Movements

- 6.3.1 Taking account of information regarding the number of vehicles in and out of the site, on a daily basis, associated with the operation of the WTP calculations have been carried out to predict the likely noise levels generated by the movement of vehicles on the site, at receptor locations.

- 6.3.2 Based on the information provided by Viridor, there will be a total of 62 HGV/RCV vehicle movements to, and 62 HGV/RCV movements from, the site on a typical weekday. These vehicle movements will typically be between 0700 and 1930 hours, therefore an hourly average of 10 total vehicle movements has been assessed.
- 6.3.3 The proposed site layout, as detailed in Drawing Number LE10104/EIA 003B indicates that the main access to the site will be via the A530 Griffiths Road.
- 6.3.4 The results of the prediction calculations are shown in Table 7.

Table 7: Predicted Noise Levels Generated by the On-Site Vehicle Movements at Receptor Locations	
Receptor	Predicted Daytime Noise Levels between 0700 and 1930 hours (Figures in dB LAeq 1Hour)
1. Manchester Road/Victoria Street/Boundary Street	27.2
2. Farms Road/St Johns Close	25.1
3. James Street	0.0
4. Bowden Drive	15.2
5. St Ann Street/Cranage Lane	26.6
6. Proposed Wade Works Residential Development	8.4

6.4 Rail Movements and Unloading/Loading of Freight Train

- 6.4.1 Based on information regarding the number of train movements associated with the development, prediction calculations have been carried out to predict the impact of noise levels generated by the loading/unloading of containers, on receptor locations. Further details of the noise prediction calculations are detailed in Appendix C.
- 6.4.2 Based on information provided by Viridor, one train will move to and from the site each day, during the daytime period. The containers will be moved on and off the freight train by a gantry crane. This unloading/loading activity will take place between 0700 and 1400 hours only.

6.4.3 The containers will be moved to and from the refining area of the MBT building by a fork lift. This unloading/loading activity will take place between 0700 and 2300 hours.

6.4.4 Predictions of the noise levels generated by the unloading/loading of rail wagons are based on noise level information provided by the technology providers and on the on-site measurements of similar activities, taken by Wardell Armstrong LLP.

6.4.5 Noise levels of train movements and unloading/loading of rail wagons, used in the assessment, are detailed in Table 8.

Activity	Measured Noise Levels (dB(A))
Train idling/propelling	76 dB(A) @ 4m
Train coupling	72.9 dB(A) @ 2m
Gantry Crane loading/unloading rail wagons	85 dB(A) @ 1m
Forklift moving rail wagons	76 dB(A) @ 8m

6.4.6 The results of the prediction calculations are shown in Table 9.

Receptor	Predicted Noise Levels at the Receptor		
	Daytime Rail movements (1430 to 1900 hours - Figures in dB L _{Aeq} 1 hour)	Unloading/ loading rail wagons (0700 to 1400 Hours - Figures in dB L _{Aeq} 1 Hour)	Moving of rail containers (0700 to 2300 Hours - Figures in dB L _{Aeq} 1 Hour)
1. Manchester Road/Victoria Street/Boundary Street	35.6	29.1	34.9
2. Farms Road/St Johns Close	10.9	5.5	13.9
3. James Street	27.3	10.8	15.1
4. Bowden Drive	25.0	21.3	26.6
St Ann Street/Cranage Lane	35.8	22.6	28.3
6. Proposed Wade Works Residential Development	23.3	14.7	19.5

6.4.7 It should be noted that the arrival, unloading, loading and moving of freight and the departure of the train will take place for approximately 4 to 5 hours per day, during the daytime period.

6.5 Cumulative Impact of the Operations

6.5.1 The noise levels predicted for the operation of the MBT plant, HWRC residual waste processing facility, on-site vehicle movements and the loading/unloading of rail wagons are shown in Tables 6, 7 and 9. The predicted noise levels have been added together to provide the total cumulative noise level at each receptor, during typical daytime and night-time periods. The results are summarised in Tables 10 to 14.

Receptor	Predicted Noise Levels of the WTP	Predicted Noise Levels of Vehicle Movements	Predicted Noise Levels of Rail Movements and Loading / Unloading of Rail Wagons *	Predicted Levels of Movement of Containers by Forklift	Predicted Noise Level of the Combined Operations
1. Manchester Road/Victoria Street/Boundary Street	35.7	27.2	35.6	34.9	40.4
2. Farms Road/St Johns Close	31.3	25.1	10.9	13.9	32.3
3. James Street	32.7	0.0	27.3	15.1	33.9
4. Bowden Drive	31.3	15.2	25.0	26.6	33.4
5. St Ann Street/Cranage Lane	35.2	26.6	35.8	28.3	39.1
6. Proposed Wade Works Residential Development	37.2	8.4	23.3	19.5	37.4

* Highest predicted noise level as shown in Table 9 included.

Table 11: Predicted Noise Levels Generated by Typical Daytime Operations (1930 to 2300 hours) of the WTP at Receptor Locations (Figures in dB L_{Aeq 1 Hour})

Receptor	Predicted Noise Levels of the WTP	Predicted Noise Levels of Rail Movements	Predicted Levels of Movement of Containers by Forklift	Predicted Noise Level of the Combined Operations
1. Manchester Road/Victoria Street/Boundary Street	35.2	35.6	34.9	40.0
2. Farms Road/St Johns Close	30.3	10.9	13.9	30.5
3. James Street	32.0	27.3	15.1	33.3
4. Bowden Drive	30.7	25.0	26.6	32.9
5. St Ann Street/Cranage Lane	35.1	35.8	28.3	38.9
6. Proposed Wade Works Residential Development	36.5	23.3	19.5	36.8

Table 12: Predicted Noise Levels Generated by Typical Night-time Operations of the Proposed Facilities between 2300 and 0700 hours, at Receptor Locations (Figures in dB L_{Aeq 5mins})

Receptor	Predicted Noise Levels of the WTP
1. Manchester Road /Victoria Street/Boundary Street	35.2
2. Farms Road/St Johns Close	30.8
3. James Street	32.8
4. Bowden Close	31.4
5. St Ann Street/Cranage Lane	35.1
6. Proposed Wade Works Residential Development	37.2

6.5.2 It should be noted that the predictions indicate that the dominant source of noise at some of the residential receptors is generally the rail movements, unloading and loading of rail wagons. This activity will only take place for approximately 4 to 5 hours during the daytime period. When the rail head is not operating the predicted noise level of the combined daytime activities of the development at the residential receptors is summarised in Tables 13 and 14.

Table 13: Predicted Noise Levels Generated by Typical Daytime Operations (0700 to 1930 hours) of the WTP at Receptor Locations (Figures in dB L_{Aeq} 1 Hour)

Receptor	Predicted Noise Levels of the WTP	Predicted Noise Levels of Vehicle Movements	Predicted Levels of Moving Containers by Forklift	Predicted Noise Level of the Combined Operations
1. Manchester Road /Victoria Street/Boundary Street	35.7	27.2	34.9	38.6
2. Farms Road/St Johns Close	31.3	25.1	13.9	32.3
3. James Street	32.7	0.0	15.1	32.8
4. Bowden Close	31.3	15.2	26.6	32.7
5. St Ann Street/Cranage Lane	35.2	26.6	28.3	36.5
6. Proposed Wade Works Residential Development	37.2	8.4	19.5	37.3

Table 14: Predicted Noise levels generated by typical daytime operations (1930 to 2300 hours) of the WTP, at Receptor Locations (Figures in dB L_{Aeq} 1 hour)

Receptor	Predicted Noise Levels of the WTP	Predicted Levels of Moving Containers by Forklift	Predicted Noise Level of the Combined Operations
1. Manchester Road /Victoria Street/Boundary Street	35.2	34.9	38.0
2. Farms Road/St Johns Close	30.3	13.9	30.4
3. James Street	32.0	15.1	32.1
4. Bowden Close	30.7	26.6	32.1
5. St Ann Street/Cranage Lane	35.1	28.3	35.9
6. Proposed Wade Works Residential Development	36.5	19.5	36.6

7. NOISE IMPACT ASSESSMENT

7.1 Introduction

7.1.1 The potential impact of the operation of the WTP has been assessed for existing and proposed receptor locations.

7.2 BS4142 Assessment of the Operations of the WTP

7.2.1 In accordance with BS4142, where noise generated by the proposed operations of the facility contains discrete impulses and/or audible tonal qualities, a +5dB correction has been applied to the predicted noise level to provide a rating level.

7.2.2 As part of the BS4142 assessment procedure, the predicted rating levels are then compared with the background noise levels at the identified receptors.

7.2.3 To minimise the noise impact of the proposed development at existing receptor locations, mitigation measures have been incorporated into the site design.

Assessment of the Daytime Operations of the Proposed WTP between 0700 and 1930 hours:

7.2.4 The predicted rating levels for the daytime operations, i.e. 0700 to 1930 hours have been compared to the background noise levels measured at the residential receptors. The results for each receptor location are detailed in Table 15.

Table 15: Assessment at Residential Receptor Locations for Daytime Operations of the Proposed WTP, including rail movements and/or loading/unloading of Rail Wagons between 0700 and 1930 hours (Figures in dB L_{Aeq1 Hour})						
	Manchester Road / Victoria Street / Boundary Street	Farms Road / St Johns Close	James Street	Bowden Drive	St Ann Street / Cranage Lane	Proposed Wade Works Residential Development
Predicted Specific Noise i.e. Operational noise level of the Proposed WTP, on-site vehicle movements, rail movements and loading/unloading of rail wagons	40.4	32.3	33.9	33.4	39.1	37.4
Acoustic Feature Correction*	+5.0	+5.0	+5.0	+5.0	+5.0	+5.0
Predicted Rating level	44.1	32.7	35.8	36.0	42.5	38.2
Average Background Noise level	46.3	41.8	39.4	38.9	50.6	38.9
Excess of rating over Background level	-2.2	-9.1	-3.6	-2.9	-8.1	-0.7

*Rating not applied to noise generated by vehicle movements

7.2.5 The results in Table 15 indicate that during the typical daytime period, the predicted rating levels likely to be generated by the operation of the proposed development will be less than the background noise level at the existing and proposed receptors. This includes the noise of rail wagons being unloaded and loaded (i.e. for approximately 4-5 hours per day). In accordance with BS4142 the noise levels generated during the daytime period are of less than marginal significance at these receptors.

7.2.6 When rail wagons are not being unloaded and loaded, the predicted rating levels for the daytime operations have also been compared to the background noise levels measured at the residential receptors. The results for each receptor location are detailed in Table 16.

Table 16: Assessment at Residential Receptor Locations for Daytime Operations of the Proposed WTP between 0700 and 1930 hours. No Rail movements and loading/unloading of Rail Wagons (Figures in dB L_{Aeq1 Hour})						
	Manchester Road / Victoria Street / Boundary Street	Farms Road / St Johns Close	James Street	Bowden Drive	St Ann Street / Cranage Lane	Proposed Wade Works Residential Development
Predicted Specific Noise i.e. Operational noise level of the Proposed WTP and on-site vehicle movements	38.6	32.3	32.8	32.7	36.5	37.3
Acoustic Feature Correction*	+5.0	+5.0	+5.0	+5.0	+5.0	+5.0
Predicted Rating level	41.4	32.6	33.2	34.7	37.7	37.7
Average Background Noise level	46.3	41.8	39.4	38.9	50.6	38.9
Excess of rating over Background level	-4.9	-9.2	-6.2	-4.2	-12.9	-1.2

* Rating not applied to the noise generated by vehicle movements

7.2.7 The results in Table 16 indicate that during the typical daytime period the predicted rating level likely to be generated by the operations of the proposed development will be significantly below the background noise levels, at the receptors. The daytime noise levels generated are therefore unlikely to have a significant adverse impact on the residents at these receptor locations.

Assessment of the Daytime Operations of the Proposed WTP between 1930 and 2300 hours:

7.2.8 The predicted rating levels for the daytime operations between 1930 and 2300 hours have been compared to the background noise levels measured at the residential receptors.

7.2.9 The results for each receptor location are detailed in Table 17.

Table 17: Assessment at Residential Receptor Locations for Day-time Operations of the Proposed WTP between 1930 and 2300 hours, including Rail Movements (Figures in dB L_{Aeq1} Hour)						
	Manchester Road / Victoria Street / Boundary Street	Farms Road / St Johns Close	James Street	Bowden Drive	St Ann Street / Cranage Lane	Proposed Wade Works Residential Development
Predicted Specific Noise i.e. Operational noise level of the Proposed WTP, on-site vehicle and rail movements	40.0	35.0	33.3	32.9	38.9	36.8
Acoustic Feature Correction	+5.0	+5.0	+5.0	+5.0	+5.0	15.0
Predicted Rating level	43.9	31.0	35.5	35.7	42.4	37.7
Average Background Noise level	46.3	41.8	39.4	38.9	50.6	38.9
Excess of rating over Background level	-2.4	-10.8	-3.9	-3.2	-8.2	-1.2

7.2.10 The results in Table 17 indicate that between 1930 and 2300 hours, the predicted rating level likely to be generated by the operation of the proposed development will be significantly less than the background noise levels at the receptors. In accordance with BS4142 the noise levels generated during this period are of less than marginal significance at these receptors.

7.2.11 When there are no rail movements, the predicted rating levels for the daytime operations have been compared to the background noise levels measured at the residential receptors. The results for each receptor location are detailed in Table 18.

	Manchester Road / Victoria Street / Boundary Street	Farms Road / St Johns Close	James Street	Bowden Drive	St Ann Street / Cranage Lane	Proposed Wade Works Residential Development
Predicted Specific Noise i.e. Operational noise level of the Proposed WTP	38.0	30.4	32.1	32.1	35.9	36.6
Acoustic Feature Correction	+5.0	+5.0	+5.0	+5.0	+5.0	+5.0
Predicted Rating level	41.1	30.9	32.6	34.3	37.3	37.2
Average Background Noise level	46.3	41.8	39.4	38.9	50.6	38.9
Excess of rating over Background level	-5.2	-10.9	-6.8	-4.6	-13.3	-1.7

7.2.12 The results in Table 18 indicate that during the typical daytime period the predicted rating level likely to be generated by the operations of the proposed development will be significantly below the background noise levels, at the receptors. The daytime noise levels generated are therefore unlikely to have a significant adverse impact on the residents at these receptor locations

Assessment of the Night-time Operations of the Proposed WTP between 2300 and 0700 hours:

7.2.13 The predicted rating levels for the night-time operations between 2300 and 0700 hours have been compared to the background noise levels measured at the residential receptors.

7.2.14 The results for each existing receptor location are detailed in Table 19.

	Manchester Road / Victoria Street / Boundary Street	Farms Road / St Johns Close	James Street	Bowden Drive	St Ann Street / Cranage Lane	Proposed Wade Works Residential Development
Predicted Specific Noise i.e. Operational noise level of the Proposed WTP and rail movements	35.2	30.8	32.8	31.4	35.1	37.2
Acoustic Feature Correction	+5.0	+5.0	+5.0	+5.0	+5.0	+5.0
Predicted Rating level	35.2	31.1	33.1	31.7	35.2	37.6
Average Background Noise level	42.7	42.9	39.8	39.1	41.5	41.7
Excess of rating over Background level	-7.5	-11.8	-6.7	-7.4	-6.3	-4.1

7.2.15 The results in Table 19 indicate that between 2300 and 0700 hours, the predicted rating level likely to be generated by the operations of the proposed development will be significantly less than the background noise levels at the receptors. In accordance with BS4142 the noise levels generated during the night-time period are of less than marginal significance at these receptors.

Summary of the BS4142 Assessments

7.2.16 The results of the BS4142 assessment for daytime and night-time operations indicate that the predicted noise rating levels likely to be generated by the proposed facilities will be below the background noise levels, at all receptors locations.

8. CONCLUSIONS

8.1.1 The potential noise impacts of the operation of the proposed MBT plant, HWRC residual waste processing facility, on-site vehicle movements and the loading/unloading of rail wagons have been assessed for existing and proposed sensitive receptor locations.

8.1.2 Observations made during the noise survey indicate that the current ambient noise levels at the receptors in the vicinity of the site, are predominantly influenced by the traffic on the local road network.

8.1.3 Prediction calculations have been carried out to determine the noise levels likely to be generated by the WTP, together with on-site vehicle movements and the loading/unloading of rail wagons, at the residential receptor locations. These calculations have taken into consideration the mitigation measures proposed as part of the site design.

8.1.4 To minimise the potential impact of noise levels generated by the operation of the development at existing receptors, the following measures will be incorporated:

- The construction materials of the northern facade of the waste reception hall and the western façade of the mechanical separation process building of the WTP, will provide a level of attenuation of no less than 30dB(A).
- The construction materials of the northern facade of the mechanical separation process building of the WTP, will provide a level of attenuation of no less than 34dB(A).
- The construction materials of the remaining facades of the buildings proposed to house the WTP facilities will provide a level of attenuation of no less than 25dB(A).
- A 2.4m high acoustic fence will be constructed immediately adjacent to the northern boundary of the site, i.e. adjacent to the railway sidings.
- The doors of the MBT and HWRC waste treatment buildings will remain closed when feasible;
- The implementation of best working practice.

8.2 The noise assessment concludes that with the implementation of the mitigation measures as part of the site design, the noise levels likely to be generated by the

proposed development will not have an adverse impact at the existing and proposed residential receptor locations adjacent to the site.



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