9 NOISE & VIBRATION

9.1 Introduction

9.1.1 This Chapter reports the likely significant effects of the Proposed Development in terms of noise and vibration in the context of the Site and surrounding area. In particular it considers the likely significant effects of noise and vibration from the Proposed Development and its impact on nearby receptors.

9.1.2 This Chapter (and its associated figures and appendices) is not intended to be read as a standalone assessment and reference should be made to the front end of this Environmental Impact Assessment Report (EIAR) (Chapters 1 – 5), as well as the final chapter, 'Summary of Residual and Cumulative Effects' (Chapter 16).

9.2 Legislation, Policy and Guidance

9.2.1 The relevant legislation, policy and guidance are listed below, with details provided in Appendix 9.1.

Planning Policy

9.2.2 The applicable planning policy is summarised as follows:

- Scottish Planning Policy.
- Planning Advice Note 1/2011: Planning and Noise.

Guidance

9.2.3 The applicable guidance is summarised as follows:

- British Standard 5228-1:2009+A1:2014 Code of Practice for noise and vibration control on construction and open sites – Part 1: Noise (BS5228-1).
- British Standard 5228-2:2009+A1:2014 Code of Practice for noise and vibration control on construction and open sites – Part 2: Vibration (BS5228-2).
- British Standard 4142 + A1:2019: Methods for rating and assessing industrial and commercial sound (BS4142).
- British Standard 8233:2014 Guidance on sound Insulation and noise reduction for buildings (BS8233).
- Department of Transport's Technical Memorandum Calculation of Road Traffic Noise 1998 (CRTN).

9.3 Assessment Methodology and Significance Criteria

Scope of the Assessment

9.3.1 The activities associated with the construction phase of the Energy Recovery Park (ERP) have the potential to generate noise and create an impact on the surrounding area. The potential noise impact during the construction phase has been assessed against the BS5228-1 ABC method. The magnitude of any impacts has been established, and the significance of the construction noise impact has been determined.

9.3.2 In addition to the construction activities, construction vehicle movements to and from the site have the potential to generate noise at existing sensitive receptors, in the immediate vicinity of the local road network. This potential noise impact has been considered against the existing baseline noise levels and vehicle movements within the local area.

9.3.3 Work involving heavy plant on an open site is likely to generate vibration, which may, in certain circumstances, propagate beyond the boundary of the site. In situations where particularly heavy plant, vibrating compaction equipment or piling rigs are being used close to the site boundary, nearby sensitive receptors may experience ground-borne vibration. Therefore, an assessment of the potential impact has been undertaken to ascertain what, if any, operations are likely to cause unacceptable levels of vibration at nearby sensitive receptors. The magnitude of any impacts has been established, and the significance of the construction vibration impact has been determined.

9.3.4 To assess the potential noise impact from the operational phase, the potential noise levels from the ERP has been predicted using noise data provided by the Client in the noise modelling software SoundPLAN v8.2 (SoundPLAN). SoundPLAN uses geographical information to generate a model of the study area to generate noise contours. The noise model includes all proposed site buildings and significant sources of noise associated with the operations of the facility. SoundPLAN uses the methodology set out in ISO 9613-2:1996 ‘Attenuation of sound during propagation outdoors’.

9.3.5 The calculated noise levels have then been compared against measured background sound levels following the guidance in BS4142, and potential impacts evaluated. The

magnitude of any impacts has been established, and the significance of the operational noise impact has been determined.

9.3.6 In addition to the operational noise from the ERP, vehicle movements to and from the Proposed Development have the potential to generate additional noise at existing sensitive receptors, in the immediate vicinity of the local road network. This potential noise impact has been considered against existing baseline noise levels and existing vehicle movements within the local area. The significance of any change in noise levels at existing sensitive receptors has been determined.

9.3.7 Vibration is not considered to be a significant effect during the operational phase of the proposed development. Mitigation measures would be incorporated within the design of the facility in order to reduce or remove any vibration that would result from operation of the site.

Consultation Undertaken to Date

9.3.8 The proposed methodology for the noise and vibration assessment was sent in an email to East Ayrshire Council (EAC) on 13th January 2021. On the 20th January 2021, Mr Grant Taylor, Environmental Health Officer (EHO) at EAC agreed to the proposed methodology.

9.3.9 In summary, the following was agreed:

- The assessment considers the baseline noise levels at existing sensitive receptors and the potential effect of the noise from activities associated with the ERP at each receptor.
- Unattended background noise measurements will be undertaken during the daytime and night-time period at the locations which are representative of the existing sensitive receptors surrounding the site.
- The potential noise impact during the construction phase will been assessed against the BS5228-1 ABC method. The magnitude of any impacts will be established, and the significance of the construction noise impact will be determined.
- The potential noise levels from the Energy Recovery Park will be predicted using noise data provided by the Client. These noise emission levels will be used in noise modelling software SoundPLAN v8.2 to create a noise model of the Energy Recovery Park and the surrounding area.

- The calculated noise levels will be compared against measured baseline noise levels and guidance contained within British Standard 4142 + A1:2019: Methods for rating and assessing industrial and commercial sound (BS4142).

Assessment Methodology

9.3.10 The method of baseline data collection and assessment has been agreed with EAC and is in accordance with current guidance and industry best practice.

9.3.11 A 3D noise model was created in SoundPLAN. Each piece of plant and building has been included in the model. Noise prediction calculations have been undertaken to predict the noise levels likely to be generated by typical operational activities associated with the proposed ERP and the resultant noise levels at existing sensitive receptor locations.

9.3.12 The prediction calculations have utilised noise measurement information provided by the Client.

9.3.13 The potential sources of noise associated with the proposed development are detailed in Section 9.5 of this chapter.

9.3.14 The calculations have been carried out in accordance with the prediction methodologies set out in BS5228-1 and BS4142.

9.3.15 To reduce the potential impact of operational noise from the development on existing receptors, mitigation measures will be implemented. These measures are discussed in Section 9.7 of this chapter.

Significance Criteria

9.3.16 The potential noise effects associated with the ERP have been assessed in accordance with the guidance detailed in Section 9.2 of this chapter to determine whether statutory objectives are exceeded or whether undesirable/desirable consequences may arise for the receiving environment. Where potential adverse impacts are identified, appropriate mitigation measures are proposed to avoid, reduce or compensate for the adverse effects. The significance of an environmental impact will be determined not only by the magnitude of the impact but also by the sensitivity of the receptor. The significance of construction noise and vibration, and operational noise, is shown in Tables 9.1, 9.2 and 9.3, respectively, as well as the determination of the sensitivity of the receptor, in Table 9.4 below.

Table 9.1 Magnitude of Construction Noise Impact	
Sensitivity	**Description**
Large	Noise levels exceed the Assessment Category threshold level for the duration of the construction works.
Medium	Noise levels exceed the Assessment Category threshold level for periods of more than one month, but for significantly less than the whole duration of the construction works.
Small	Noise levels exceed the Assessment Category threshold level for periods of less than one month.
Negligible	Noise levels do not exceed the Assessment Category threshold level during any period.

Table 9.2 Magnitude of Vibration Noise Impact		
Sensitivity	**Change in Vibration Level**	**Description**
Large	> 10mm per sec	Vibration likely to be intolerable for more than brief exposure. Approaching the level at which cosmetic damage may occur in light structures.
Medium	5mm – 10mm per second	Tolerance less likely even with prior warning and explanation.
Small	1mm – 5mm per second	Complaints are likely but can be tolerated if prior warning and explanation given.
Negligible	<1mm per second	Below level at which complaints are likely.

Table 9.3 Magnitude of Operational Noise Impact		
Sensitivity	**Change in Noise Level**	**Description**
Large	> 10dB increase	Impact resulting in a considerable change in baseline environmental conditions predicted either to cause statutory objectives to be significantly exceeded or to result in severe undesirable/desirable consequences on the receiving environment.
Medium	5.1 – 10dB increase	Impact resulting in a discernible change in baseline environmental conditions predicted either to cause statutory objectives to be marginally exceeded or to result in undesirable/desirable consequences on the receiving environment.
Small	0.1 – 5dB increase	Impact resulting in a discernible change in baseline environmental conditions with undesirable/desirable conditions that can be tolerated
Negligible	≤0dB increase	No discernible change in the baseline environmental conditions, within margins of error of measurement

Table 9.4 Sensitivity of Receptor	
Sensitivity	**Receptor Type**
High	Receptor/resource has little ability to absorb change without fundamentally altering its present character, or is of international or national importance. For example hospitals, residential care homes, and internationally and nationally designated nature conservation sites which are also known to contain noise sensitive species (i.e. noise may change breeding habits or threaten species in some other way).
Medium	Receptors/resource has moderate capacity to absorb change without significantly altering its present character. For example residential dwellings, offices, schools, and play areas. Locally designated nature conservation sites which are also known to contain noise sensitive species (i.e. noise may change breeding habits or threaten species in some other way).
Low	Receptor/resource is tolerant of change without detriment to its character or is of low or local importance. For example industrial estates.
Negligible	Receptor/ resource is not sensitive to noise.

9.3.17 The significance of an environmental impact for construction noise, road traffic noise and on-site operational noise is determined by the interaction of magnitude and sensitivity. The Impact Significance Matrix used in this assessment is shown in Table 9.5.

Table 9.5 Impact Significance Matrix				
Magnitude	**Sensitivity**			
	High	**Medium**	**Low**	**Negligible**
Large	Very Substantial	Substantial	Moderate	None
Medium	Substantial	Substantial	Moderate	None
Small	Moderate	Moderate	Slight	None
Negligible / Beneficial	None	None	None	None

9.3.18 The threshold between insignificant and significant lies between “Moderate” and “Substantial”. Moderate impacts might be noticeable and intrusive but may cause only a small change in behaviour. Substantial impacts might be noticeable and disruptive and might cause a material change in behaviour or attitude.

Sensitive Receptors

9.3.19 The existing noise sensitive receptors nearest to the ERP were identified through a desktop study of the surrounding land using available maps and aerial photography. The existing noise sensitive receptors identified in Table 9.6, and shown on Figure 9.1,

are those receptors most likely to be affected by noise from the ERP. The locations chosen as existing sensitive receptors are those likely to experience the greatest impact due to noise emissions from the operations.

Table 9.6 Existing Noise Sensitive Receptor Locations

Receptor	Grid Co-ordinates		Bearing from Site
	Easting	Northing	
ESR1 - Killochside	247373	620178	West
ESR2 - Creoch Farm	247621	620983	North
ESR3 - Provost Mount	247699	619863	South
ESR4 - Laigh Tarbeg Farm	248758	620479	East

9.4 Baseline Conditions

9.4.1 To establish the baseline noise levels at existing sensitive receptors, a background noise survey was undertaken by Wardell Armstrong LLP between the 1st March 2021 and 3rd March 2021.

9.4.2 Noise measurements were carried out at four monitoring locations; considered to be representative of the existing noise sensitive receptors. A 24-hour noise measurement was captured at each location. The monitoring locations are shown on Figure 9.1 and are as follows:

- ML1: Unattended noise monitoring at Killochside (ESR1), approximately 315m to the west of the proposed development. The microphone was positioned in the receptor's garden, closest to the proposed development. Road traffic and bird song were audible.
- ML2: Unattended noise monitoring at Creoch House (ESR2), approximately 615m to the north of the proposed development. The microphone was positioned in the receptor's garden, closest to the proposed development. Bird song and activity from the Hargreaves site were audible.
- ML3: Unattended noise monitoring at Provost Mount (ESR3), approximately 350m to the south of the proposed development. The microphone was positioned in the receptor's garden, closest to the proposed development. Road traffic and bird song were audible.
- ML4: Unattended noise monitoring at Laigh Tarbeg (ESR4), approximately 650m to the east of the proposed development. The microphone was positioned in the receptor's garden, closest to the proposed development. Road traffic, bird song and farming activity were audible.

9.4.3 Noise monitoring was undertaken for a 24-hour period, to reflect the continuous operational hours of the ERP.

9.4.4 The noise measurements were made using Type 1, integrated sound level meters. The microphones were mounted on tripods 1.5m above the ground and more than 3.5 metres from any other reflecting surfaces with the diaphragms horizontal.

9.4.5 All noise monitoring took place during dry and calm weather conditions. The sound level meters were calibrated to a reference level of 94dB at 1kHz both before, and on completion of, the noise survey. No drift in calibration over 0.5dB was recorded during the survey.

9.4.6 A-weighted[1] L_{eq}[2] and L_{90}[3] noise levels have been measured to comply with the requirements of the Scottish Planning Policy and BS4142. A-weighted maximum sound pressure levels were also measured to provide additional information.

Existing Measured Noise Levels

9.4.7 The results for each of the monitoring locations are presented in Table 9.7. The noise monitoring results are provided in full at Appendix 9.2.

Table 9.7: Measured Weekday Noise Levels

Monitoring Locations	Average Daytime (dB) $L_{Aeq, 11\ hour}$	Average Evening (dB) $L_{Aeq, 5\ hour}$	Average Night time Level (dB) $L_{Aeq, 8\ hour}$	Daytime Range (dB) $L_{A90, 11\ hour}$	Evening Range (dB) $L_{A90, 5\ hour}$	Night time Range (dB) $L_{A90, 8\ hour}$
ML1	50	51	42	34 - 45	32 - 43	22 - 43
ML2	49	39	41	26 - 42	30 - 35	19 - 33
ML3	51	47	44	42 - 47	28 - 43	20 - 46
ML4	60	57	52	42 - 49	35 - 46	34 - 44

Uncertainty

9.4.8 To reduce measurement uncertainty, the following steps have been taken:

- The background noise measurement location was selected to be representative of the background noise level at ESRs.

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

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

- In accordance with guidance, the sound level meter was mounted on a tripod 1.5m above the ground. The monitoring location was also more than 3.5 metres from any other reflecting surfaces;
- The noise measurements were taken during dry and calm weather conditions for most of the monitoring period. Any periods of adverse weather conditions have been removed from the assessment data;
- The noise measurements were undertaken during proposed operational times and are representative of the daytime and night-time periods;
- The daytime and night-time background noise measurements were undertaken in accordance with the reference period required by BS4142;
- The results of each measurement period were reported to the nearest 0.1dB; and;
- Background noise measurements were made using a Class 1 integrating sound level meter.

9.5 Assessment of Effects

Design Solutions and Assumptions

9.5.1 The Applicant is proposing to install and operate an ERP which will incorporate an Energy from Waste Plant (EfW) and Waste Reception Area (WRA) and stack, which each have the potential to cause an adverse noise impact at receptors.

9.5.2 Vehicle deliveries and collections will also contribute to the noise climate. However, vehicle movements to and from the site are not considered to significantly impact on road traffic noise levels. Each potential source of operational noise is identified below.

Waste Reception Area (WRA)

9.5.3 Non-hazardous commercial, construction and industrial waste will be received into the WRA between the hours of 0700 and 1800 Monday to Friday and 0700-1200 on a Saturday.

9.5.4 The WRA has been designed to allow ease of access and the most efficient delivery of waste to the facility, which will see waste being delivered via a range of vehicles, including bulk articulated vehicles, refuse collection vehicles, compactors and skip tippers.

9.5.5 Fast acting roller shutter doors will allow multiple delivery vehicles to enter the tipping hall simultaneously. On entering the reception hall vehicles will discharge their

payload directly into the waste bunker. Front end loaders will be employed to manage the incoming waste where it cannot be discharged directly into the waste bunker, for example where waste must be quarantined within the waste reception hall.

9.5.6 A summary of the noise information associated with the WRA, together with the sound power levels of plant associated with activities within the waste reception area, is detailed in Table 9.8 and 9.9 below.

Table 9.8: Noise Level Information of Plant associated with the EfW

Facility	Associated Plant	Percentage On-time	Octave Band Spectra (Figures in dB(Z))									Sound Power per unit (Figures in dB (A))
			31.5	63	125	250	500	1000	2000	4000	8000	A
Waste Reception Area	Tipping Hall	20%	84	84	84	77	74	74	74	65	71	80

Table 9.9: Noise Level Information of Plant associated with the WRA

Facility	Associated Plant	Data Source	Percentage On-time	Noise Level, Sound Power per unit (dB(A)) unless stated
Waste Reception Area	Wheeled Loader (x2)	BS5228-1, Table C.2 Ref No 27	100%	108
	Tipper Lorry (Waste Delivery x 3)	BS5228-1, Table C.8 Ref No 20	50%	106

Energy from Waste Plant (EfW)

9.5.7 The EfW will be in the form of a conventional energy recovery facility, which will sustainably manage non-hazardous and non-recyclable residual waste. See Chapter 4 for more information. The EfW will operate 24 hours per day, 7 days per week, 365 days per year.

9.5.8 A summary of noise level data of plant associated with the EfW Facility is given in Table 9.10 and 9.11. All data has been provided by the Client.

Table 9.10: Noise Level Information of Plant associated with the EfW

Facility	Associated Plant	Percentage On-time	Octave Band Spectra (Figures in dB(Z))	Sound Power per unit

			31.5	63	125	250	500	1000	2000	4000	8000	(Figures in dB (A))
Air Cooled Condenser	Air Cooled Condenser Fans (x2)	100%	94	97	94	92	90	87	83	76	67	92
Turbine Hall	Turbine Air Coolers	100%	92	86	92	92	88	84	80	74	73	90
Flue Gas Treatment	Flue Gas Treatment	100%	83	86	83	83	82	78	78	77	71	85
Stack	Stack Outlet (silenced)	100%	93	91	93	88	85	81	75	68	61	87
Boiler House	Furnace and Boiler Hall	100%	82	85	82	82	81	77	77	76	70	84
IBA Store	Bottom Ash	100%	77	85	77	71	71	69	68	68	59	75
Collection	HGV	100%	108	110	108	102	99	98	95	90	85	103

Table 9.11: Noise Level Information of Plant associated with the EfW

Facility	Associated Plant	Percentage On-time	Sound Power per unit (dB(A))
			A
Switchyard	Transformer – 20 MVA (x1)	100%	70 dB @ 1m
	Transformer – 2000kVA (x2)	100%	60 dB @ 1m
FGT Residue Silos	Silos	100%	88
Bunker	Bunker	100%	85
Technical Building	Compressor	100%	83
Turbine Hall	Turbine Hall	100%	95

9.5.9 The fast-acting automatic doors for the tipping hall and roller shutter doors have been included in the model, and are understood to provide 10 dB and 18 dB noise attenuation respectively.

On-Site Vehicle Movements

9.5.10 There will be additional traffic movements as a result of the proposed ERP. Following a review of the information from the appointed transport consultant, Transport

Planning Ltd, the increase in traffic is understood to be between 1% and 2% on the sections of the A70. The increase in HGVs is understood to be around 5% on the section of the A70 to the west of the ERP and up to 14% on the sections of the A70 to the east of the ERP.

9.5.11 The Design Manual for Roads and Bridges (DMRB) Volume 11 Section 3 Part 7 HD 213/11 defines the threshold for determining whether a traffic noise assessment is required. If during the daytime and night-time period there is a permanent change in magnitude of 3 dB(A) in the long term (typically 15 years after project opening), then a detailed assessment is required. HD213/11 Chapter 3 Table 3.2 defines a change in noise of 3 dB(A) or less has a negligible impact in the long term. HD213/11 Annex 1 – Assessment Approach paragraph A1.8(ii) states that "a change in noise level of 3 dB(A) is equivalent to a 100% increase… in traffic flow".

9.5.12 A 7% increase in traffic flow to the west of the site and 16% increase in traffic flow to the east would cause a change of noise level in the order of 1 dB(A) on the road network leading away from the site entrance. The impact of increased traffic can be considered to be negligible and has not been assessed further.

Assessment of Effects

Noise from Construction Phase Activities

9.5.13 During the construction phase, any work carried out at the proposed development is likely to generate noise that may propagate beyond the proposed development boundary.

9.5.14 Activities on the site, which could give rise to construction noise impacts if carried out, could include (but are not limited to):

- Site preparation i.e. ground excavation, levelling of ground, trenching, trench filling, unloading and levelling of hardcore and compacting filling;
- Construction of the buildings, including piling, fabrication processes e.g. planning, sanding, routing, cutting, drilling and laying foundations; and,
- Installation of the process plant and erection of stack.

9.5.15 The above activities have the potential to generate short-term increases in noise levels, above those recommended in BS5228-1. The levels of noise received at the receptors closest to the proposed development phases would depend on the sound power levels of the machines used, the distance to the properties, the presence of

screening or reflecting surfaces and the ability of the intervening ground to absorb the propagating noise.

9.5.16 Based on the ambient noise levels measured, the appropriate category value has been determined for each of the sensitive receptors, as detailed in Table 9.12. Details of the noise survey carried out at the sensitive receptors are set out in Section 9.4 of this chapter.

Table 9.12 Construction Noise Assessment Criteria

Monitoring Location	Existing Sensitive Receptor Location	Average Measured Daytime Noise Levels dB L_{Aeq}	Ambient Noise Level Rounded to the nearest 5dB L_{Aeq}	Appropriate Category Value A, B or C in accordance with BS5228-1	Noise Level above which activities of the Construction Phase may cause a significant impact at the Receptor dB L_{Aeq}
ML1	ESR1 - Killochside	50	50	A	65
ML2	ESR2 – Creoch Farm	49	50	A	65
ML3	ESR3 - Provost Mount	51	50	A	65
ML4	ESR4 - Laigh Tarbeg Farm	60	60	A	65

9.5.17 Noise generated by the earthworks and construction phases of the development may have a short-term, adverse impact at the above sensitive receptors. However, due to the distances between the development and all receptors, it is considered unlikely that the construction activities will generate noise levels in excess of those detailed in Table 9.12.

9.5.18 The affected sensitive receptors are of medium sensitivity, in accordance with Table 9.4. It is considered that the magnitude will be negligible due to the distance of sensitive receptors from the source, in accordance with Table 9.1. Therefore, it is considered that the impact of construction noise will be negligible, in accordance with Table 9.5.

9.5.19 To minimise the potential levels of noise generated by the construction works best working practice will be put in place. Details can be found in Section 9.7 of this chapter.

Vibration from Construction Phase Activities

9.5.20 BS5228-2 indicates that the threshold of perception is generally accepted to be between a peak particle velocity (PPV) of 0.14 and 0.3mm/sec. In an urban situation

it is unlikely that such vibration levels would be noticed. BS5228 also indicates that it is likely that vibration of 1.0 mm/s in residential environments will cause complaint but can be tolerated if prior warning and explanation has been given to residents. The standard also indicates that 10 mm/s is likely to be intolerable for any more than a very brief exposure to this level.

9.5.21 The Highways Agency Research report No. 53 "Ground Vibration caused by Civil Engineering Works" 1986 suggests that, when vibration levels from an unusual source exceed the human threshold of perception, complaints may occur. The onset of complaints due to continuous vibration is probable when the PPV exceeds 3mm/sec.

9.5.22 British Standard BS6472: 2008 "Guide to Evaluation of human exposure to vibration in buildings. Part 1: Vibration sources other than blasting" (BS6472-1) suggests that adverse comments or complaints due to continuous vibration are rare in residential situations below a PPV of 0.8mm/sec. Continuous vibration is defined as "vibration which continues uninterrupted for either a daytime period of 16 hours or a night-time period of 8 hours". The proposed earthworks and construction work at the site will not cause continuous vibration as defined in BS6472-1.

9.5.23 Human perception of vibration is extremely sensitive. People can detect and be annoyed by vibration before there is any risk of structural damage. Cases where damage to a building have been attributed to the effects of vibration alone are extremely rare; even when vibration has been considered to be intolerable by the occupants.

9.5.24 It is not possible to establish exact vibration damage thresholds that may be applied in all situations. The likelihood of vibration induced damage or nuisance will depend upon the nature of the source, the characteristics of the intervening solid and drift geology and the response pattern of the structures around the site. Most of these

variables are too complex to quantify accurately and thresholds of damage, or nuisance, are therefore conservative estimates based on a knowledge of engineering.

9.5.25 Where ground vibration is of a relatively continuous nature, there is a greater likelihood of structural damage occurring, compared to transient vibration; for example, that caused by transiting vehicles.

9.5.26 BS5228-2 suggests that the onset of cosmetic damage is 15mm/sec (15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz for residential or light commercial type buildings).

9.5.27 WA's archives contain field trial measurements of ground vibration associated with types of machinery likely to be used during the construction of the Proposed Development. The representative measured levels made by WA using a Vibrock B801 Digital Seismograph, are set out in Table 9.13.

Table 9.13: Measured Vibration Levels of Plant Under Normal Operating Conditions

Plant Type	Distance from Source		
	10m (mm/s)	20m (mm/s)	30m (mm/s)
25-30 tonne excavator	0.175	0.075	Background
25 tonne dumptruck (Volvo A25) Loaded Empty	 1.000 0.225	 0.150 0.050	 Background Background
Dozer	1.050	0.400	Background
Vibrating roller Drum Vibrator on Vibrator off	 4.470 0.500	 3.270 0.150	 2.350 0.050
Loading shovel	1.025	0.150	Background

9.5.28 Vibration generated by the earthworks and construction phases of the development may have a short-term, adverse impact at the above sensitive receptors. However, due to the distances between the development and all receptors, it is considered unlikely that the construction activities will generate vibration levels in excess of those detailed in Table 9.13.

9.5.29 The affected sensitive receptors are medium sensitivity, in accordance with Table 9.4. It is considered the magnitude will be negligible due to the distance of sensitive receptors, in accordance with Table 9.2. Therefore, it is considered that the impact of construction noise will be negligible, in accordance with Table 9.5.

9.5.30 Due to the distance of receptors from the proposed development, it is considered that vibration does not need to be considered further.

Noise Prediction Calculations for the Proposed Energy Recovery Park

9.5.31 The potential noise levels at nearby receptors, generated by operational activities at the proposed ERP, will be affected by the acoustic insulation properties of the facility building, the distance of each noise source from the receptors, any intervening barriers, and any noise mitigation measures implemented (as detailed in Section 9.7 of this report).

9.5.32 A 3D noise model was created in noise modelling software SoundPLAN. Each piece of plant and all buildings have been included in the models. Noise models have been used to predict the noise levels likely to be generated by typical operational activities associated with the proposed ERP, and the resultant noise levels at existing sensitive receptor locations.

9.5.33 As existing dwellings are of sufficient height to overlook the development, noise breakout via roof structures, as well as facades of the facility has been included in the noise models.

Assumptions

9.5.34 Noise predictions are based on noise data provided by the Client as detailed in Section 9.5 of this report for the various processes anticipated within the ERP.

9.5.35 To provide a robust assessment, it is considered that the existing materials of the buildings will provide a low level of acoustic absorption, therefore, an absorption coefficient of 0.01 has been used for the internal floors and an absorption coefficient of 0.025 have been used for the internal walls and ceilings in the calculations. However, as it is anticipated that several tonnes of waste will remain in the ERP at any one time; the waste will provide additional acoustic absorption, and as such, the reverberant sound pressure within the ERP would be expected to be less than has been included into the noise model. Therefore, the noise models are a worst-case in this regard.

9.5.36 The majority of plant at the proposed ERP will be situated within the proposed building. Information provided by the architect and building material manufacturer for the development indicates that the envelope of the proposed building will be clad with Kingspan Trapezoidal Roof and Wall Panel KS1000. This cladding is understood to provide a sound insulation of 24dB R_w.

Impact of the Operations Associated with the Energy Recovery Park

9.5.37 Noise modelling has been undertaken to predict the noise emissions from the ERP at receptors. The predicted noise levels of each process within the ERP building, external plant and vehicle movements have been calculated to provide the total cumulative noise level at each receptor, during typical daytime and night-time periods.

9.5.38 The noise modelling considers that the WRA operates during the daytime and evening, and the EfW and stack operates continuously.

9.5.39 The results of the modelling for the operation of the ERP at each receptor are shown in Table 9.14

Table 9.14: Predicted Noise Levels Generated by the Operations of the ERP at Sensitive Receptor Locations (Figures in dB L_{Aeq})

Receptor	Day (0700-1800)	Evening (1800-2300)	Night (2300-0700)
ESR1 - Killochside	40	39	39
ESR2 – Creoch Farm	33	33	33
ESR3 - Provost Mount	36	33	33
ESR4 - Laigh Tarbeg Farm	31	25	25

9.6 Noise Impact Assessment - *BS4142 Assessment*

Introduction

9.6.1 In accordance with BS4142, an industrial noise assessment has been carried out to assess the impact of sound from the proposed ERP on existing sensitive receptors.

Rating level

Acoustic Feature Correction

9.6.2 BS4142 includes guidance on the application of an additional weighting which should be applied to the specific sound level should the industrial noise be tonal, impulsive, or intermittent, as experienced at proposed receptors.

9.6.3 All proposed plant would run continuously and therefore no penalty for impulsivity or intermittency has been applied. It is assumed all proposed plant within the ERP would be designed with mitigation, such that sound breakout would not be tonal at the

existing sensitive receptors. Therefore, no correction has been applied to the specific sound level.

9.6.4 All HGV movements at the facility would be similar to road traffic on the A70, which is the dominant noise source heard at all receptors. Therefore, no penalty has been applied to the specific sound level.

Selection of the Background Sound

9.6.5 Section 8 of BS4142 provides guidance on the selection of the background sound to be used in the assessment. BS4142 states that the background sound levels should be representative of the period being assessed (i.e. daytime or night-time periods), and that there is no "single" background sound level.

9.6.6 For the purpose of the assessment the range of background sound levels during the day and night-time periods, measured at monitoring locations 1-4, have been used. The data collected and presented within Appendix 11.2 is considered representative of the $L_{A90,1hour}$ daytime and $L_{A90,15\ minutes}$ night-time, background sound levels at existing sensitive receptors.

Comparison of the Background Sound and Rating Levels

Daytime Assessment

9.6.7 In accordance with BS4142, the rating level of industrial noise at the existing receptors has been compared with the representative background sound levels. HGV deliveries will cease at approximately 1800 hours, therefore, and in accordance with Scottish Planning Policy, a separate assessment has been undertaken for daytime (0700-1800) evening (1800-2300 hours), and night-time (2300-0700 hours). The results for each receptor location are shown in Tables 9.15, 9.16 and 9.17 for the daytime, evening and night-time period respectively.

Table 9.15: Comparison of rating level and background sound levels for Daytime Operations of the ERF, between 0700 and 1800 hours

Receptor	ESR 1 – Killochside	ESR 2 – Creoch House	ESR 3 – Provost Mount	ESR 4 –Laigh Tarbeg Farm
Specific Noise Level, L_{Aeq} (dB)	40	33	36	31
Acoustic Feature Correction	0			

Calculated Rating Level (dB)	40	33	36	31
Measured Background Sound Level at Each Receptor Location L_{A90} (dB)	34 - 45	26 - 42	42 - 47	42 - 49
Lowest Excess of rating over Background level	-5	-9	-11	-18
Highest Excess of rating over Background level	+6	+7	-6	-11

Table 9.16: Comparison of rating level and background sound levels for Evening Operations of the ERF, between 1800 and 2300 hours

Receptor	ESR 1 – Killochside	ESR 2 – Creoch House	ESR 3 – Provost Mount	ESR 4 –Laigh Tarbeg Farm
Specific Noise Level, L_{Aeq} (dB)	39	33	33	25
Acoustic Feature Correction	0			
Calculated Rating Level (dB)	39	33	33	25
Measured Background Sound Level at Each Receptor Location L_{A90} (dB)	32 - 43	30 - 35	28 - 43	35 - 46
Lowest Excess of rating over Background level	-4	-2	-10	-21
Highest Excess of rating over Background level	+7	+3	+5	-10

Table 9.17: Comparison of rating level and background sound levels for Night-time Operations of the ERF, between 2300 and 0700 hours

Receptor	ESR 1 – Killochside	ESR 2 – Creoch House	ESR 3 – Provost Mount	ESR 4 –Laigh Tarbeg Farm
Specific Noise Level, L_{Aeq} (dB)	39	33	33	25

Acoustic Feature Correction	0			
Calculated Rating Level (dB)	39	33	33	25
Measured Background Sound Level at Each Receptor Location L_{A90} (dB)	22 - 43	19 - 33	20 - 46	34 - 44
Lowest Excess of rating over Background level	-4	±0	-13	-19
Highest Excess of rating over Background level	+17	+14	+13	-9

9.6.8 The results in Tables 9.15, 9.16 and 9.17 indicate that during the daytime, evening and night-time hours, the predicted rating level likely to be generated by the operations of the proposed development will be below the highest existing background noise level at all existing sensitive receptor locations during all periods. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.

9.6.9 However, during the quieter periods of the daytime, evening and night-time, the predicted rating level likely to be generated by the operations of the proposed development will be above the background noise level at ESR1 and ESR2 and ESR3 during the evening and night-time. In accordance with BS4142, a difference of around +5dB is an indication of an adverse impact, and +10dB is likely to be an indication of a significant adverse impact, depending on context.

9.6.10 In accordance with BS4142 an assessment of the context in which the industrial sound resides must be undertaken to determine the potential noise impact.

BS4142 Context Assessment

9.6.11 BS4142:2014 states “The significance of sound of an industrial and/or commercial nature depends upon both the margin by which the rating level of the specific sound

sources exceeds the background sound level and the context in which the sound occurs".

9.6.12 The first requirement of this statement has been determined within the noise impact assessment section above. To determine the context in which the industrial sound will reside, three factors must be considered, these are;

- The absolute level of sound;
- The character and level of the residual sound compared to the character and level of the specific sound; and;
- The sensitivity of the receptor.

Absolute Level of Sound

9.6.13 To determine the first context test in BS4142 it is necessary to determine whether the residual and background sound levels are high or low. Section 11 of BS4142 states;

"Where background sound levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background. This is especially true at night.

Where residual sound levels are very high, the residual sound might itself result in adverse impacts or significant adverse impacts, and the margin by which the rating level exceeds the background might simply be an indication of the extent to which the specific sound source is likely to make those impacts worse."

9.6.14 As shown in Tables 9.15, 9.16 and 9.17, the background sound levels and rating levels at each receptor are low. Therefore, in accordance with BS4142, the absolute level is as, or more, relevant when establishing a potential impact.

9.6.15 In order to assess the proposed ERP in the context of its environment and that of each of the existing sensitive receptors, the predicted specific sound level from the ERP have been added to the measured average ambient noise levels to give the absolute level of noise at receptors with the ERP operating.

9.6.16 This future absolute noise level has been compared against the existing ambient noise level, and the predicted change in noise has been stated.

9.6.17 The results for ESR1, ESR2 and ESR3 for daytime, evening and night-time periods are detailed within Tables 9.18, 9.19 and 9.20 respectively.

Table 9.18: Context Assessment at Existing Sensitive Receptors for Daytime Operations of the ERP, between 0700 and 1800 hours Figures in dB L_{Aeq}

Receptor	ESR 1 – Killochside	ESR 2 – Creoch House	ESR 3 – Provost Mount
Average Measured Ambient Noise Level i.e. Existing sound level without the proposed ERP operations	50	49	51
Predicted Specific Noise i.e. Operational noise level of the ERP only	40	33	36
Total absolute level of sound i.e. Existing sound level plus ERP sound level	50	49	51
Difference between existing ambient sound levels and predicted future sound levels	0	0	0

Table 9.19: Context Assessment at Existing Sensitive Receptors for Evening Operations of the ERP, between 1800 and 2300 hours Figures in dB L_{Aeq}

Receptor	ESR 1 – Killochside	ESR 2 – Creoch House	ESR 3 – Provost Mount
Average Measured Ambient Noise Level i.e. Existing sound level without the proposed ERP operations	51	39	47
Predicted Specific Noise i.e. Operational noise level of the ERP only	39	33	33
Total absolute level of sound i.e. Existing sound level plus ERP sound level	51	40	47
Difference between existing ambient sound levels and predicted future sound levels	0	+1	0

Table 9.20: Context Assessment at Existing Sensitive Receptors for Night-time Operations of the ERP, between 2300 and 0700 hours Figures in dB L_{Aeq}

Receptor	ESR 1 – Killochside	ESR 2 – Creoch House	ESR 3 – Provost Mount
Average Measured Ambient Noise Level i.e. Existing sound level without the proposed ERP operations	42	41	44
Predicted Specific Noise i.e. Operational noise level of the ERP only	39	33	33
Total absolute level of sound i.e. Existing sound level plus ERP sound level	44	41	44

Difference between existing ambient sound levels and predicted future sound levels	+2	0	0

9.6.18 The assessment of the absolute level of noise shows that the proposed ERP will not lead to any increase in the existing ambient noise levels at the nearby sensitive receptors during the daytime period. This is a positive indication that noise from the ERP will not be significant at the existing sensitive receptor locations.

9.6.19 However, during the evening period there is a possibility of a 1dB increase at ESR 2 and during the night-time period a 2dB increase at ESR 1. A change in noise of up to 3dB is generally regarded as a negligible change. Therefore, it is unlikely that this increase will be noticeable to residents.

9.6.20 Therefore, the potential noise impact of the ERP at ESRs is likely to be less than is suggested by Tables 9.15, 9.16 and 9.17.

Character and Level of Residual and Specific Sound

9.6.21 The character of the residual sound, which contains mid frequency noise from road traffic and industrial noise from the Hargreaves site to the north and Barr site to the east, and the character of the specific sound of the proposed development will be very similar. Therefore, the proposed development is thought to be in keeping with the immediate area.

9.6.22 The assessment shows that the average level of the residual sound and the calculated level of the specific sound are similar. In addition, they are both considered to be low.

9.6.23 This is a positive indication that the noise impact from the proposed development would be less than is suggested by Tables 9.15, 9.16 and 9.17.

Sensitivity of Receptor and Existing Acoustic Conditions

9.6.24 With regard to pertinent factors to be taken into consideration, Section 11 of BS4142 states;

"The sensitivity of the receptor and whether dwellings or other premises used for residential purposes will already incorporate design measures that secure good internal and/or outdoor acoustic conditions, such as:

i. facade insulation treatment;

ii. ventilation and/or cooling that will reduce the need to have windows open so as to provide rapid or purge ventilation;

iii. and acoustic screening."

9.6.25 The proposed receptors will have moderate sensitivity given their residential nature, as in accordance with Table 9.4.

9.6.26 Additionally, there appears to be no screening of the proposed development for sensitive receptors.

Summary of BS4142 Context Assessment

9.6.27 The context assessment shows that the measured, existing ambient sound level is very similar to the predicted ambient sound level with the development in place and that the character of the specific sound is very similar to the residual sound in the surrounding area. It can be concluded that the effect of the proposed development is overstated slightly by the exceedance of the background noise levels by the specific noise from the proposed ERP.

9.6.28 In order to determine the significance of the noise levels with the proposed ERP in place, the absolute noise levels have been compared to guideline noise levels, as detailed in BS8233.

BS8233 Context Assessment

9.6.29 Based on site observations, existing sensitive receptors on the whole appear to be naturally ventilated with no specific mitigation measures to control noise ingress from the surrounding area. With windows open, the attenuation provided by the façade will be approximately 13dB(A).

9.6.30 In order to assess the proposed ERP in the context of its environment and that of each of the existing sensitive receptors, a comparison of the absolute noise level and

guideline noise levels has been undertaken, for both external and internal living areas, as shown in Tables 9.21 and 9.22 below.

Table 9.21: Comparison of Absolute Noise Levels at Sensitive Receptor Locations and Guideline Noise Levels - External Areas (Figures in dB L_{Aeq})

Description	ESR1 - Killochside	ESR2 – Creoch Farm	ESR3 - Provost Mount
	Day (0700-1800)	**Day (0700-1800)**	**Day (0700-1800)**
Absolute Noise Level, LAeq (dB)	50	49	51
Attenuation, L_{Aeq} (dB)	0	0	0
Desirable Noise Guideline Level stated in BS8233, L_{Aeq} (dB)	50	50	50
Upper Noise Guideline Level stated in BS8233, L_{Aeq} (dB)	55	55	55
Comparison between absolute level and desirable guideline level	±0	-1	+1
Comparison between absolute level and upper guideline level	-5	-6	-4

Table 9.22: Comparison of Absolute Noise Levels at Sensitive Receptor Locations and Guideline Noise Levels – Internal Areas (Figures in dB L_{Aeq})

Description	ESR1 - Killochside			ESR2 – Creoch Farm			ESR3 - Provost Mount		
	Day (0700-1800)	**Evening (1800-2300)**	**Night (2300-0700)**	**Day (0700-1800)**	**Evening (1800-2300)**	**Night (2300-0700)**	**Day (0700-1800)**	**Evening (1800-2300)**	**Night (2300-0700)**
Absolute Noise Level, LAeq (dB)	50	51	44	49	40	41	51	47	44
Façade Attenuation, L_{Aeq} (dB)	13								
Calculated Internal Noise Level, LAeq (dB)	37	38	31	36	27	28	38	34	31
Noise Guideline Level Stated	35		30	35		30	35		30

in BS8233, L_{Aeq} (dB)									
Comparison between calculated level and guideline level	+2	+3	+1	+1	-8	-2	+3	-1	+1

9.6.31 Table 9.21 shows that during the daytime, in external areas, the absolute sound level would be below the upper guideline noise level of 55dB(A) in gardens of ESRs, and below the desirable noise guideline level of 50dB(A) in gardens of ESR 1 and 2. As shown in Table 9.7, however, the measured ambient noise levels at all receptors are the same as the absolute level shown in Table 9.21 above. Therefore, the impact of the ERP is negligible.

9.6.32 Table 9.22 shows that during the daytime, evening and night-time, with windows open, the absolute sound level would slightly exceed internal noise guideline levels in living rooms and bedrooms of ESRs. As shown in Table 9.7, however, the measured ambient noise levels at all receptors already exceed internal noise levels, without the proposed ERP in place, and therefore the impact of the ERP is negligible.

9.6.33 Taking this context into consideration, the impact at ESR 1, ESR 2 and ESR 3 during the daytime, evening and night-time is considered is likely to be significantly less than is suggested in Tables 9.15, 9.16 and 9.17.

Summary of BS4142 Assessment

9.6.34 In summary, we have found that noise from the ERP, on occasions, would exceed the background sound level at receptors. However, both the background sound level are low, and noise from the ERP will not significantly change the existing ambient sound levels at receptors. In addition, noise from the ERP is thought to be in keeping with the character of noise at the receptors. Furthermore, ambient noise levels, when included noise from the ERP, are significantly below the internal and external noise guideline levels stated in BS8233 when considering an open window for attenuation.

9.6.35 Therefore, when considering the context of the sound from the ERP, the overall noise impact is considered to be low during the daytime and minor adverse during the quiet parts of the evening and night-time.

9.6.36 In any case, mitigation measures will be incorporated into the site design to reduce noise emissions where feasible and Best Available Technology (BAT) will be adopted, which will further reduce noise from the ERP at receptors.

9.6.37 The affected sensitive receptors are considered to be of moderate sensitivity in accordance with Table 9.4. It is considered that the magnitude will be small in accordance with Table 9.3 as the activities will cause a change in the baseline environment but will not cause an exceedance of guideline objectives. The impact is therefore considered to be moderate, however with mitigation measures in place the impact is seen as negligible.

9.7 Mitigation

Noise from Construction Phase Activities

9.7.1 To minimise the potential levels of noise generated by the construction works, best working practice would be put in place where possible. The construction works will follow the guidelines in BS5228-1 and the guidance in BRE Controlling particles, vapour and noise pollution from construction sites, Parts 1 to 5, 2003.

9.7.2 The following measures will be put in place to minimise noise emissions:

- All plant and machinery will be regularly maintained to control noise emissions, with particular emphasis on lubrication of bearings and the integrity of silencers.
- Broadband reversing alarms will be chosen instead of tonal alarms.
- Site staff will be made aware that they are working adjacent to a residential area and avoid all unnecessary noise due to misuse of tools and equipment, unnecessary shouting and radios.
- A further measure to reduce noise levels at the sensitive receptors will include, as far as possible, the avoidance of two noisy operations occurring simultaneously in close proximity to the same sensitive receptor.
- Adherence to the restriction of operating hours imposed by East Ayrshire Council.
- Ensure engines are turned off when possible.
- Should construction activities need to be carried out during night-time hours, this will be discussed with the local authority, which may include a planning condition which requests advance notice and details of any night working to provided.

Noise from the Energy Recovery Park

9.7.3 As part of the safe and on-going operation of the EPR, BAT will be implemented. This will help to ensure that the noise impact of the operational activities of the proposed facility on existing receptors is further reduced.

9.7.4 Using BAT, specific mitigation will be applied to the operating machinery within the internal areas of the ERP. It is understood that these mitigation measures will be put in places to comply with The Control of Noise at Work Regulations 2005. Once implemented, these measures will ensure that the noise levels within the vicinity of the operation plant in the ERP buildings will be 80dB(A). This will have a positive effect on the noise impact experienced at existing sensitive receptors and can be confirmed through compliance testing at existing sensitive receptors once the facility is in full operation.

9.7.5 Other mitigation measures will include the implementation of best working practice to ensure that the impact of the operational activities of the proposed facilities on existing receptors is minimised. These include:

- All plant and machinery will be regularly maintained to control noise emissions, with particular emphasis on lubrication of bearings and the integrity of silencers.
- Broadband reversing alarms will be chosen instead of tonal alarms.
- Site staff will be aware that they are working in the vicinity of residential properties and avoid all unnecessary noise due to misuse of tools and equipment, unnecessary shouting and radios. Noisy external activities such as cleaning and maintenance will be scheduled to avoid night-time working in the vicinity of sensitive receptors where possible.
- Ensure engines are turned off when possible.

9.7.6 In accordance with the requirements of East Ayrshire Council a site noise monitoring scheme will be implemented at the site prior to commencement of operations. It is proposed that the site noise monitoring scheme be developed through consultation with the Environmental Health Department at East Ayrshire Council and should include the following details:

- Proposed noise monitoring locations.
- Proposed hours and duration of noise monitoring.
- Frequency of noise monitoring.

- Appropriate monitoring equipment.

9.8 Residual Effects

9.8.1 Given compliance with the above measures, in particular the proper maintenance of equipment and of the access road surface, there will not be any significant residual impact of noise on nearby existing sensitive receptors.

9.9 Assessment of Cumulative Effects

9.9.1 There are no other noise sources in sufficiently close proximity to the ERP for cumulative noise impacts to occur at the existing sensitive receptors.

9.10 Comparison to Consented Development

9.10.1 The predicted noise levels at each sensitive receptor considered in the consented development are lower than those predicted in this assessment. However, the same conclusion has been drawn for this assessment, that during the construction and operational phase of the development, with mitigation measures in place, the impact of the proposed development is not significant.

9.11 Summary

9.11.1 This chapter describes an assessment of the potential noise impacts associated with the proposed ERP.

9.11.2 To establish baseline noise levels, at a number of existing sensitive receptors an attended noise survey has been carried out.

9.11.3 The potential noise impacts affecting existing sensitive receptors with regard to construction and operational activities associated with the facility have been considered, and have been assessed using appropriate guidance. A robust, 'worst-case' scenario has been considered, with the facility operating fully.

9.11.4 Where mitigation measures are required to control potential noise levels from the facility, details of such measures have been provided in outline terms.

Noise from Construction Phase Activities

9.11.5 During the construction phase, any work carried out at the proposed development may generate noise that may propagate beyond the proposed development boundary. The noise generated however is considered to be negligible and not significant in accordance with Table 9.5.

9.11.6 To minimise the potential levels of noise generated by the construction works, best working practice will be put in place where possible. The construction works will follow the guidelines in BS5228-1 and the guidance in BRE Controlling particles, vapour and noise pollution from construction sites, Parts 1 to 5, 2003.

Vibration from Construction Phase Activities

9.11.7 During the construction phase, any work carried out at the proposed development may generate vibration that may propagate beyond the proposed development boundary, however due to the distance of receptors this is unlikely to be felt. The vibration generated is considered to be negligible and not significant in accordance with Table 9.5.

Development Generated Road Traffic Noise

9.11.8 Access to the site is gained directly from the A70 via the existing site access already used to route HGVs onto the local road network. It is considered that the additional HGVs will not significantly increase road traffic noise levels at existing sensitive receptors as HGV movements from the site already form part of the ambient noise levels. However, 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 movements have therefore been considered within the operational noise assessment.

9.11.9 The noise from additional HGVs is considered to be negligible and not significant in accordance with Table 9.5.

Noise from the Proposed Energy Recovery Park

9.11.10 Prediction calculations have been carried out to determine the noise levels likely to be generated by noise breaking out of the facility building, together with on-site vehicle movements, at each of the existing residential receptors. Noise levels have been predicted based on data provided by the technology providers and BS 5228-1.

9.11.11 Based on several assessments, in accordance with BS4142, it has been found that there is a potential for operational noise levels to exceed background levels during the daytime, evening and night-time period at existing sensitive receptors located closest to the ERP. This is likely to be an indication of an adverse to significant adverse impact, depending on the context.

9.11.12 In accordance with BS4142, the context in which the sound resides must be considered as part of the assessment. As demonstrated in this assessment, when considering context, the noise impact at receptors will be significantly less and is not considered to be significant adverse.

9.11.13 The impact is considered to be moderate, however with mitigation measures in place the impact is seen as negligible in accordance with Table 9.5.

Mitigation Measures

9.11.14 Mitigation measures have been presented within this chapter to minimise noise emissions during construction phase activities.

9.11.15 During the operational phase of the development, BAT will be used to reduce the potential impact of noise levels generated by the operational phase of the facility.

9.11.16 In accordance with the requirements of East Ayrshire Council a site noise monitoring scheme will be implemented at the site prior to commencement of operations. It is proposed that the site noise monitoring scheme be developed through consultation with the Environmental Health Department.