EASTER LANGLEE ADVANCED THERMAL TREATMENT PLANT

PROPOSED ADVANCED THERMAL TREATMENT PLANT AT EASTER LANGLEE, LANGSHAW ROAD, GALASHIELS

ENVIRONMENTAL STATEMENT
VOLUME 1: MAIN REPORT

April 2013

This report has been prepared in support of the planning application for an Advanced Thermal Treatment (ATT) plant at Easter Langlee, Galashiels, Scottish Borders. The application has been prepared on behalf of New Erath Solutions (Scottish Borders) Ltd and has been co-ordinated by AXIS with technical inputs from:

- AXIS – Planning and Landscape & Visual
- Atkins – Noise, Air Quality, Layout and Design

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FOREWORD

This Environmental Statement is submitted in support of a planning application made by New Earth Solutions (Scottish Borders) Ltd to develop an Advanced Thermal Treatment (ATT) plant on land at Easter Langlee Landfill Site, Galashiels, Scottish Borders. The Environmental Statement comprises the following documents:

- The Environmental Statement (ES) Main Report (Volume 1), which contains the detailed project description; an evaluation of the current environment in the area of the proposed development; the predicted environmental impacts of the scheme and details of the proposed mitigation measures which would alleviate, compensate for, or remove those impacts identified in the study. Volume 1 also includes a summary of the overall environmental impacts of the proposed development and all relevant schematics, diagrams and illustrative figures and technical appendices (including details of the methodology and information used in the assessment, detailed technical schedules and, where appropriate, raw data); and

- Non-Technical Summary (Volume 3), containing a brief description of the proposed development and a summary of the ES, expressed in non-technical language.

Copies of the documents, as a two volume set together with the Planning Application Document (PAD) are available at a cost of £200 from New Earth Solutions Group Ltd, Key House, 35 Black Moor Road, Ebblake Industrial Estate, Verwood, Dorset, BH31 6AT. In addition, all of the planning documentation can be downloaded from the planning section of Scottish Borders Council's website. An electronic CD copy of the full application can be made available by New Earth Solutions Scottish Borders) Ltd on request for a charge of £5. Requests should be made to the above address fao Rachel Surbuts or via e-mail to Rachel.surbuts@newearthgroup.co.uk. The information is also available at www.newearthsolutions.co.uk/scottishborders.

1.0 INTRODUCTION AND BACKGROUND

1.1 Introduction

1.1.1 This Environmental Statement (ES) supports and accompanies the planning application made by New Earth Solutions (Scottish Borders) Ltd (hereafter referred to as NES) for the development of an Advanced Thermal Treatment (ATT) plant on land forming part of the existing waste management site at Easter Langlee, Langshaw Road, Galashiels, Scottish Borders.

1.1.2 The ES reports the findings of the Environmental Impact Assessment (EIA) process. It describes the proposal and provides an assessment of the likely environmental effects that may arise from the construction and operation of the facility.

1.1.3 This chapter describes the background to the planning application, provides an outline description of the proposed development, describes the site's location and surrounding context, provides details of the applicant and defines the structure of the ES.

1.2 Background to the Development

1.2.1 NES entered into a 24 year contract with the Scottish Borders Council (SBC) for the treatment of their municipal waste in 2011. The contract requires the development of a new residual waste treatment facility, in addition to the processing of mixed dry recyclables and the composting of green waste. The service is intended to manage around 65,000 tonnes of the Council's municipal waste each year.

1.2.2 In May 2002 outline planning consent (reference 02/00178/OUT) was granted for the development of an integrated materials recovery and composting facility on land at Easter Langlee landfill site. The planning permission was granted subject to compliance with two conditions. Condition 1 required the approval of the Planning Authority for the means of access, the layout of the site, the design and siting of any buildings & plant and associated landscape treatment. Condition 2 required that details be provided in respect of the

means of water supply and both surface & foul drainage. In February 2007 planning permission (reference 06/02477/SBC) was granted by SBC to renew the outline consent.

1.2.3 The site subject of the outline planning consent was identified by SBC (in their role as waste disposal authority) as the preferred location for the development of a facility for the management of the Council's mixed residual municipal waste.

1.2.4 On the 12th January 2010, the Technical Services Department within SBC submitted a planning application (reference 10/00165/AMC) for the approval of matters reserved in Conditions 1 and 2 attached to the outline planning consent. NES became a joint applicant with the Council following its appointment as Preferred Bidder for the waste management contract in December 2010. The application related to the development of a mechanical and biological waste treatment (MBT) plant capable of handling 50,000 tonnes of mixed residual waste and was subsequently granted planning consent on 11th April 2011, subject to 12 Conditions. The MBT plant is hereafter referred to as the 'consented waste facility'.

1.2.5 The process that was to be undertaken at the consented waste facility can be summarised as follows:

- Receipt of mixed residual waste;
- Mechanical sorting and screening to recover recyclables and produce refuse derived fuel (RDF);
- Aerobic composting of biodegradable components of the waste;
- Further screening of residues from the biological processing; and
- Maturation of the residues to create 'compost like product'.

1.2.6 The consented waste facility is to be contained within a series of buildings and structures, comprising:

- A waste reception building;
- Main waste treatment hall;
- Screening hall;
- Control room;
- Scrubber;

- Biofilters; and
- Water storage tanks.

1.2.7 Figure 1.1 provides further details of the layout of the consented waste facility.

1.2.8 Following the grant of planning permission NES have successfully discharged all conditions precedent[1] and have constructed a length of the proposed access road. The planning permission has been implemented and therefore remains extant indefinitely.

1.3 Modifications to the Consented Project

1.3.1 NES intends to modify the consented proposals in two main ways. Firstly, to amend the processes that would be carried out within the consented waste facility from a combination of mechanical processing and bio-stabilisation to mechanical processing aimed at the preparation of a Refuse Derived Fuel (RDF) for subsequent thermal treatment / generation of renewable energy. This part of the proposals is hereafter referred to as the 'fuel preparation facility'.

1.3.2 The RDF that would be produced at the fuel preparation facility would primarily comprise of items of biological origin (e.g. paper, card, food, cotton, wool, bio-plastics and plant waste etc) that cannot be recycled. It is anticipated that the process would generate circa 24,000 tonnes per annum (tpa) of RDF which would be transferred directly to the proposed ATT plant.

1.3.3 The changes to the internal process undertaken within the consented waste facility fall within the description of the development within the current planning permission (for a 'material recovery and composting' facility) and no changes are proposed to the external envelope of the consented waste treatment buildings. As a consequence, these changes do not require modification of the extant planning permission.

[1] A condition precedent requires the submission of details for approval prior to work commencing on the site.

1.3.4 Secondly, the element to which planning permission is sought, is for the development of an ATT plant on the area that currently benefits from planning permission for the development of a screening hall, link building and control room (none of which would be required if the ATT plant project proceeds).

1.3.5 The ATT plant would utilise a combination of both pyrolysis and gasification processes. RDF would first be converted by pyrolysis into a syngas and char. The gas would then be filtered and cleaned to produce a product gas and the char would be removed and collected separately.

1.3.6 The char would then be gasified to produce a gasification gas which would subsequently be combusted to provide the heat needed for the pyrolysis stage.

1.3.7 The filtered and cleaned pyrolysis (product) gas would be directed to one of four 'combined heat and power (CHP) gas engines' which would be capable of generating, in combination, circa 2.9 MWe of electricity of which 2.7 MWe would be available (after parasitic loads are taken into account) for supply to the local electricity supply grid. The plant would also incorporate equipment for the recovery of heat released by the gas engines, which would be capable of supplying an average of 1.2 MWth of heat (in the form of hot water) to a planned district heating network.

1.3.8 The proposed ATT plant would comprise the following main elements:

- An advanced thermal conversion building - to house the pyrolysis and gasification equipment;
- An energy recovery building – to house the CHP gas engines;
- Gas buffer storage tanks and booster;
- 23m high exhaust and 9m high flare stack;
- Biofilter building and associated 11.4m high biofilter stack;
- Bunded Storage Tanks;
- Ancillary development (including an oil tank and transformers); and
- Landscaping.

1.3.9 In terms of considering the proposals, it must be noted that the proposed buildings would have a slightly larger footprint than those associated with the consented waste facility, but would be of no greater height. Indeed, with the exception of the 23m exhaust (which would be shared between the advanced thermal treatment process equipment and the gas engines) no other equipment proposed in connection with the ATT plant would exceed the height of the currently consented buildings / ancillary structures.

1.3.10 A detailed description of the proposed development and its operation is contained within Chapter 3.0 of this ES.

1.4 The Site and Its Context

1.4.1 The proposed ATT plant development is within the Easter Langlee waste management complex, on the south-west facing slope of Wester Hill and Blackies Hill and to the east of the existing built up area of Galashiels, circa 3km from the town centre (see Figure 1.2 Site Location Plan).

1.4.2 The application site itself occupies circa 0.45 hectares (ha) of land on one of the restored areas of Easter Langlee landfill site. It has a relatively even topography and slopes gently downwards to the east.

1.4.3 The site is bounded to the south by an area of restored landfill, beyond which is an area currently being developed for housing. Further to the south (adjacent to Melrose Road) is a mature belt of trees. To the north is Easter Langlee landfill site and associated recycling centre / waste transfer centre. To the immediate west is the area proposed for the consented waste facility, beyond which is a surface water attenuation lagoon which serves the existing landfill and slightly further to the west is an operational aggregate recycling facility. To the west of the site the land has, until recently, been used as an open-windrow composting facility, beyond which is a car park and leachate lagoons.

1.4.4 Beyond the boundaries of the waste management complex to the north, east and west the land is predominantly agricultural. There is a complex of large agricultural buildings which is located approximately 500m to the north-west

of the application site. The Allan Water runs along the eastern boundary of the wider waste complex and forms part of the River Tweed special area of conservation (SAC).

1.4.5 There are a number of other designated ecological sites within the surrounding area which comprise the Avenel Hill and Gorge Site of Special Scientific Interest (SSSI) which is situated adjacent to the northern part of the waste complex, circa 320 metres from the development site; the River Tweed SAC and SSSI is located circa 420m to the south, circa 560m from the development site and Gattonside Moss SSSI situated circa 2.5km to the north east, circa 2.65km from the development site.

1.4.6 The nearest residential properties to the application site are located to the south west, with the nearest property being circa 400m from the boundary of the site. However, it should also be noted that three planning permissions have been granted for residential development on land to the south of the site, these comprise:

- Planning Application (reference 11/00832/FUL) – 118 Dwellings Granted Planning Permission on 6th October 2011;
- Planning Application (reference 12/00194/FUL) – 49 Dwellings Granted Planning Permission on 31 May 2012; and
- Planning Application (reference 12/00803/FUL) – 396 Dwellings Granted Planning Permission on 6th October 2011.

1.4.7 These houses are currently under construction and at their nearest point will be circa 180m from the boundary of the development site.

1.4.8 The site is located within the wider Easter Langlee waste management complex and would be accessed directly from the main spine road serving the site. The spine road itself currently connects to the T-junction with Langshaw Road and beyond that the B6374 Galashiels to Gattonside Road to the south.

1.4.9 Further details of the sites location and surrounding context are provided on Figure 1.2 Site Location Plan.

1.5 The Applicant

1.5.1 NES provides waste treatment and composting services to local authorities using proven mechanical and biological treatment technologies. The Company's design, build, finance and operate capabilities deliver recycling and landfill diversion performance, helping local authorities to achieve or exceed their statutory targets.

1.5.2 In addition to the core waste management business, NES has established a renewable energy business, New Earth Energy (NEE). This business will generate low-carbon renewable energy from refuse-derived fuels and biomass using emerging ATT technologies in the form of pyrolysis and gasification. It is also involved in anaerobic digestion (AD) projects.

1.5.3 NES has two existing operational in-vessel composting (IVC) facilities and three mechanical biological treatment (MBT) facilities. Its first commercial energy recovery scheme is now being commissioned, having been built in 2012. The Easter Langlee proposals would be NES's sixth waste management centre and the second, third or fourth NEE energy recovery facility (depending on the relative progress of other schemes elsewhere).

1.6 This Document

1.6.1 This document is the Environmental Statement (ES), which has been prepared to accompany the Easter Langlee ATT plant planning application. It describes the potential environmental effects of the proposed scheme, both during its construction and operation. It has been prepared in accordance with European Community (EC) Directives on the assessment of the effects of certain projects upon the environment (85/337/EEC updated by 97/11/EEC). This legislation is now manifest in Scotland through the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2011 (EIA Regulations), with which this report is fully compliant.

1.6.2 Following on from this introduction, Chapter 2.0 of the ES outlines the scope of the assessment whilst Chapter 3.0 provides a detailed scheme description including an outline of the proposed construction methods. Chapters 4.0 to

8.0 assess the potential environmental impacts of the proposal during its construction and operation, including proposed mitigation measures, under a series of headings. Finally Chapter 9.0 summarises the assessment findings.

2.0 SCOPE OF THE ENVIRONMENTAL IMPACT ASSESSMENT

2.1 Introduction

2.1.1 Under Regulation 6 of the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2011 (the EIA Regulations) potential applicants may request a Screening Opinion from the local planning authority, in this case SBC. This is a written confirmation as to whether, in the view of the local planning authority, a planning application for a particular development needs to be supported by an EIA. On the 3rd August 2012 NES submitted a formal request for a Screening Opinion from SBC (see Appendix 2-1). Following this request, SBC adopted their formal Screening Opinion on 28th August 2012, which confirmed that based upon the information provided, the planning application for the proposed ATT plant did not need to be supported by an EIA (see Appendix 2-2).

2.1.2 Following receipt of SBC's formal Screening Opinion the ATT plant project has progressed and in order to ensure that any potentially significant effects of the proposed development are fully understood / assessed NES has elected to carry out an EIA in support of the planning application.

2.1.3 Environmental Impact Assessment (EIA) is the process culminating in the production of this report, the Environmental Statement (ES). The objective of the process is to identify and evaluate all significant, direct and indirect environmental effects of the proposed development, during both construction and operation, on the environment.

2.2 Establishing the Scope of the Environmental Statement

2.2.1 Under Regulation 14 of the EIA Regulations, potential applicants may request a Scoping Opinion from the local planning authority to confirm the information that would need to be provided in the ES.

2.2.2 NES has not elected to formally Scope the content of this ES with SBC on this occasion. This is on the basis that the application site already benefits from planning permission (granted in April 2011) for the development of a waste treatment facility and associated infrastructure. The planning

application for the consented waste facility was supported by a number of detailed assessments covering a range of environmental topics. In addition, a large amount of supplementary environmental information has been prepared and submitted to SBC pursuant to the discharge of conditions precedent. As a consequence, the environmental baseline for the application site and the potential effects of the proposed development are already understood and provide sufficient detail for EIA.

2.2.3 In terms of determining the scope of the EIA, it is important to note that the proposed ATT plant:

1. Is to be developed on the same development platform as the consented waste facility (thus the extent of built development will not extend beyond that which has previously been assessed in relation to the consented waste facility, nor will the formation of ground of foundation works be different);
2. comprises buildings that (with the exception of a 23m high exhaust) are not materially different in terms of their height, scale and massing to those proposed as part of the consented waste facility;
3. Would not materially alter the extent of hardstanding proposed in connection with the consented waste facility; and
4. Would result in a reduction in the number of vehicles required to visit the site when compared to the consented waste facility.

2.2.4 In addition to the above, it is also important to note that the potential environmental effects of the consented waste facility have already been considered in detail in a number of up-to-date assessments. These have concluded that on the basis recommended mitigation measures are implemented, the development would not give rise to any significant environmental effects.

2.2.5 Taking into account the aforementioned factors, it is not considered the development of the proposed ATT plant would alter the outcome of the assessments carried out in support of the planning application for the consented waste facility in respect of:

- Ecology and nature conservation (with the exception of the potential indirect effects of the development associated with aerial deposition of pollutants);
- Traffic and Transportation;
- Archaeology and Heritage;
- Ground Conditions / Remediation; and
- Surface Water Drainage and Flood Risk.

2.2.6 Further justification / clarification as to why the proposed ATT plant development would not give rise to any significant environmental effects in the context of these environmental topics is provided below.

Ecology and Nature Conservation

2.2.7 A comprehensive Ecological Impact Assessment (EcIA) was carried out in support of the planning application for the consented waste facility at Easter Langlee (see Appendix 2-3). The assessment draws a number of conclusions regarding the potential environmental effects of the consented waste facility, which comprise:

- The proposed development site is not ecologically sensitive;
- The development would not adversely affect either the River Tweed SAC/SSSI or the Avenel Hill and Gorge SSSI;
- The EcIA identifies evidence of badger and otter activity in the area but confirms that the development would not adversely impact upon either;
- Woodland to the south west is suitable for red squirrel and nesting bird opportunities exist in the area. However, no effects would occur if good practice measures are followed, this includes the carrying out of construction works that would affect breeding birds (scrub clearance etc) outside of the breeding bird season;
- Woodland planting (much of which has now been planted) proposed to the south would provide opportunities for habitat enhancement; and

- If the scheme of mitigation measures set out in the EcIA is carried out there should not be any significant or adverse effects upon the ecological resource.

2.2.8 Condition 12 attached to the planning permission for the consented waste facility requires that a species and habitat mitigation plan be submitted and approved in advance of development commencing. These details have subsequently been provided to SBC and the condition has been formally discharged.

2.2.9 The proposed ATT plant would be developed on part of the development platform proposed in connection with the consented waste facility. It would also not materially alter the proposed surface water attenuation scheme (including the associated flow rates), foul water discharge and / or lighting scheme at the site. As a consequence, it would not give rise to any greater potential for direct or indirect effects on the local ecological resource in these regards.

2.2.10 The only element of the proposed ATT plant that would have the potential to give rise to effects on ecological interests that has not been assessed in connection with the consented waste facility, is potential for the aerial deposition of pollutants from the proposed exhaust. This has therefore been scoped into the EIA and assessed in detail in the air quality assessment contained within Chapter 7.0. This concludes that the proposals would not have the potential to give rise to any significant environmental effects upon the surrounding ecological resource as a result of aerial deposition from pollutants emitted from the ATT plant.

2.2.11 In light of the above, it is not considered that the proposed ATT plant development would give rise to any significant environmental effects upon the ecological / nature conservation resource.

Traffic and Transportation

2.2.12 A 'transport note' was prepared in support of the planning application for the consented waste facility (see Appendix 2-4). This confirms that the facility

would only accept residual household waste that is currently disposed of in the adjacent Easter Langlee landfill site. As a consequence, the proposals would not generate any additional vehicle movements associated with the importation of waste to the site and the only change would be in relation to outputs from the facility. The conclusions of the transport note in terms of the outputs from the consented waste facility are set out in Table 2.1 below.

Table 2.1: Outputs and Associated Vehicle Movements from Consented Waste Facility

	Tonnes per Annum	**Annual Vehicles**	**Vehicles per week / day**
Metals	1,234	62	1 per week
Plastics	1,439	72	1 - 2 per week
Compost Like Output (CLO)	5,140	257	1 – 2 per day
RDF Output	19,237	740	2 - 3 per day
Total	27,050	1,131	Maximum of 7 vehicles per day*

* This is a maximum figure based upon the assumption that the metal and plastic exports are on the same day as maximum exports of CLO and RDF.

2.2.13 The key differences between operations associated with the consented waste facility and those proposed in connection with the ATT plant development can be summarised as follows:

1. There would be no CLO produced;
2. The RDF produced at the facility would only move off-site in exceptional circumstances (i.e. if the ATT plant were unavailable for a prolonged period of time); and
3. The ATT plant would involve the export of:
    a. Ash;
    b. Aqueous effluent from the quench; and
    c. Condensate from the dryer.

2.2.14 The exports from the site associated with residues from the ATT plant process, are summarised in Table 2.2 over the page.

Table 2.2: Outputs and Associated Vehicle Movements Associated with the Proposed ATT Plant Development

	Tonnes per Annum	Annual Vehicles	Vehicles per week / day
Metals	1,234	62	1 per week
Plastics	1,439	72	1 - 2 per week
Ash	3,360*	125**	2 – 3 per week***
Aqueous Effluent from the Quench	4,000	133****	2 – 3 per week
Condensate from the Dryer	9,397	313****	1 per day
Total	27,050	705	Maximum of 5 vehicles per day*****

* Ash output is 14% of the 24,000tpa input of the facility.
** based upon 27 tonne payloads.
*** It is likely that all of the ash generated by the plant would be recovered at an off-site location as a secondary aggregate.
**** Based upon 30 tonne payloads.
***** This is a maximum figure based upon the assumption that all export movements would be on the same day.

2.2.15 It should be noted that, whilst it is anticipated that there could be up to 5 vehicles per day associated with the export of materials from the proposed ATT plant, this is very much a maximum figure and in all probability would be less than indicated on the basis that:

1. It is possible that, subject to future agreement with SBC, the ash residues from the ATT process could be disposed of directly in Easter Langlee landfill site (thus preventing movement of this material from the wider waste complex);
2. Whilst for the purposes of this planning application it has been assumed that condensate would be removed from the site by tanker, NES are currently investigating whether it would be possible for condensate to be discharged directly into the leachate treatment system associated with the landfill site; and
3. There is scope for condensate and aqueous quench effluent to be re-used on site within the energy and waste processes.

2.2.16 Based upon the foregoing, it is apparent that the proposed development would result in a reduction in the number of vehicle movements when compared to the consented waste facility development. Thus, any environmental / other effects of the ATT plant development in terms of traffic generation would be wholly beneficial.

Archaeology and Heritage

Archaeology

2.2.17 An Archaeological Written Scheme of Investigation (WSI) was submitted in support of the planning application for the consented waste facility at Easter Langlee. This drew the following conclusions regarding the archaeological potential of the site:

- Soil stripping associated with the site's former use as a gravel quarry in 1965 revealed a stone built building which was destroyed without archaeological monitoring. Examination of the stones suggested that they were of Roman origin (Newstead Fort lies nearby), or potentially post roman re-use of building materials. Contemporary excavations have found evidence of prehistoric metal working to the south west of the quarry.
- Recent examination of the pre-1965 aerial photographic record for the site revealed two areas of potential for surviving pre-1965 settlement and land use, to the north and east of the consented waste facility development.

2.2.18 The WSI recommended that further desk based assessment and intrusive investigation, in the form of trial trenching, be carried out in these two areas.

2.2.19 Condition 6 of the planning permission for the consented waste facility requires that no development should take place on the site until the applicant has secured the implementation of a programme of archaeological work in accordance with a WSI outlining an archaeological evaluation.

2.2.20 NES has subsequently undertaken a programme of archaeological investigations pursuant to the discharge of Condition 6, which considered two areas on / immediately adjacent to the site of the consented waste facility. It concludes that an archaeological watching brief should be maintained during all ground breaking works within the areas to the north and east of the development.

2.2.21 In light of the above, it is considered that as long as the recommendations of the archaeological investigation are followed, there should be no significant environmental effects upon the buried archaeological resource as a result of the proposed ATT plant development.

2.2.22 As noted previously within this Chapter, NES undertook formal EIA screening with SBC in respect of the prosed ATT plant development. The Council's Archaeology Officer was consulted as part of this process. On the 23rd August 2012, he provided the following clarification: *"While I do not feel that further archaeological work will be needed as part of an EIA, if one is ultimately submitted I recommend that the Cultural heritage chapter reference the previous work done on this site and its significance. Further work will be necessary on the site most probably in the form of a watching brief, but this can be achieved through a condition on any consent given."*

2.2.23 In accordance with the Archaeological Officers recommendations, a copy of the WSI and Archaeological Assessment undertaken in support of the consented development on the site are contained within Appendix 2-5. Furthermore, NES would be willing to accept a suitably worded planning condition requiring a watching brief during the construction of the proposed ATT plant and associated infrastructure.

Heritage

2.2.24 With regard to the potential effects of the development upon heritage assets, it should be noted that this was not an issue in connection with the consented waste facility. It is therefore not considered that the proposed ATT plant would require any assessment in this regard.

Ground Conditions / Ground Contamination

2.2.25 Condition 11 of the planning permission for the consented waste facility requires that a ground investigation report should be submitted to and approved by the local planning authority and that this shall include:

- Identification and assessment of potential contamination on the site;
- A remediation strategy, validation report and monitoring statement (including timescales for the implementation of all such measures).

2.2.26 A comprehensive assessment of the ground conditions on the site of the consented waste facility has subsequently been carried out. A series of site investigation reports and an associated remediation strategy report was then submitted to SBC for approval. The purpose of the remediation strategy was to:

1. Identify the precautions that are to be taken to ensure the safe redevelopment of the site;
2. To ensure the environmental impact of the development is minimised; and
3. To ensure that on-going risks to the groundwater environment and to the proposed new-build structures are controlled.

2.2.27 The Council has subsequently discharged Condition 11 and in doing so, has confirmed that the results of the site investigations and the proposed remediation strategy are acceptable. It follows therefore that if the mitigation measures set out in the strategy are followed, the development of the consented waste facility should not give rise to any significant environmental effects in terms of ground conditions / ground contamination.

2.2.28 On the basis that the proposed ATT plant would be developed upon the same development platform as the consented waste facility, it is considered that the results of the site investigation and the recommendations of the remediation strategy would be equally applicable to the proposed ATT plant development.

2.2.29 Given the level of information contained within the site investigations and the proposed remediation strategy, validation report and monitoring statement they have not been appended to this ES. However, a CD containing all relevant documentation can be made available upon request.

Foul and Surface Water Drainage and Flood Risk

Flood Risk

2.2.30 The Risk Framework outlined in Scottish Planning Policy defines fluvial and tidal flood risk using the following three categories:

1. Little or no risk – Annual probability of watercourse, tidal or coastal flooding is less than 0.1% (1:1000);
2. Low to medium risk – Annual probability of watercourse, tidal or coastal flooding is in the range 0.1% - 0.5% (1:1000 – 1:200); and
3. Medium to high risk – Annual probability of watercourse, tidal or coastal flooding is greater than 0.5% (1:200).

2.2.31 The site is within an area that is defined on SEPA's web-based Indicative River and Coastal Flood Map as being of 'little or no risk of flooding'. As a consequence, provided appropriate surface water drainage measures are implemented, the significance of this risk for the proposed development would be minimal and there would be negligible effects off-site.

Foul and Surface Water Drainage

2.2.32 With regard to foul and surface water drainage a comprehensive set of information was submitted by NES pursuant to the discharge of Conditions 8 and 9 attached to the planning permission for the consented waste facility. This comprised:

- A statement on the disposal of foul water;
- A statement on the disposal of storm water drainage;
- A detailed surface water drainage management schedule;
- Soak-away test results;
- Micro-drainage model calculations covering capacity, flow and sizing;
- Drainage layout drawing;
- Drainage strategy drawing;
- Surface water drainage plan including details of underlying ground conditions; and
- Plans and drawings showing the dimensions of the surface water drainage components.

2.2.33 The Flood Prevention Officer at SBC has subsequently discharged the conditions and in doing so, has confirmed that the submitted details are satisfactory and that the proposed development would not have the potential to give rise to flooding off-site.

2.2.34 It is proposed that the ATT plant would be developed on the same development platform that was proposed for the consented waste facility and would therefore not materially increase the overall amount of hardstanding at the site beyond that which was assessed in developing the drainage strategy for the consented waste facility. In addition, the proposals would only result in a negligible increase in the number of staff employed at the site. Taking these two factors into account, it is not considered that the levels of foul and surface water generated by the site would be materially different from those that would be generated by the consented development. As such, the assessments undertaken pursuant to the discharge of Conditions 8 and 9 of the previous planning permission should remain equally valid when considering the foul and surface water generated by the proposed ATT plant development. As a consequence, it is not considered that the ATT plant development would have the potential to give rise to any significant environmental effects in terms of surface water drainage and flood risk and as such, no further assessment of these issues is deemed necessary.

2.2.35 Whilst the surface and foul water flows would not be materially different, the ATT plant development would comprise different buildings and structures to those proposed as part of the consented development. In light of this, elements of the detailed drainage design proposed in connection with the consented development (drawing reference 11538-510 contained within Appendix 2-6) would need to be amended to take account of these changes.

2.2.36 Any drainage design proposed for the development would be based upon the principles that were proposed and found acceptable for the consented waste facility development. It is suggested that the requirements for the detailed drainage design be the subject of a planning condition.

2.2.37 For completeness a copy of the assessments submitted pursuant to the discharge of Conditions 8 and 9 of the consented waste management are contained within Appendix 2-6 of this ES.

Scope of the ES

2.2.38 In light of the above, the scope of the EIA that has been prepared in support of the planning application for the proposed ATT plant has been limited to the assessment of the following environmental topics:

- Landscape and Visual Effects and primarily the effects associated with the proposed exhaust
- Noise and Vibration;
- Aerial emissions from the exhaust and other elements of the ATT plant process, including the potential effects of aerial deposition on surrounding ecological / nature conservation receptors; and
- The potential environmental effects associated with the proposed electrical grid connection and the district heating network.

2.3 Compliance with the EIA Regulations

2.3.1 The scope, or requirements, of an ES are set out in Schedule 4 of the EIA Regulations. Part 1 of the Schedule details the information that the applicant is reasonably required to provide, whilst Part 2 identifies the information that the applicant must provide. These schedules are set out in full below, together with references to the chapters in the ES where information relevant to these requirements can be found.

PART I	
1. Description of the development, including in particular:	
a) a description of the physical characteristics of the whole development and the land-use requirements during the construction and operational phases;	*Chapter 3*
b) a description of the main characteristics of the production processes, for instance, nature and quantity of the materials used;	*Chapter 3*
c) an estimate, by type and quantity, of expected residues and emissions (water, air and soil pollution, noise, vibration, light, heat, radiation, etc.) resulting from the operation of the proposed development.	*Chapters 2, 3, 6, 7 and 8*
2. An outline of the main alternatives studied by the applicant or appellant and an indication of the main reasons for his choice,	*Chapter 3*

taking into account the environmental effects.	
3. A description of the aspects of the environment likely to be significantly affected by the development, including, in particular, population, fauna, flora, soil, water, air, climatic factors, material assets, including the architectural and archaeological heritage, landscape and the inter-relationship between the above factors.	*Chapter 2 and Chapters 5 - 8*
4. A description of the likely significant effects of the development on the environment, which should cover the direct effects and any indirect, secondary, cumulative, short, medium and long-term, permanent and temporary, positive and negative effects of the development, resulting from:	*Chapter 2 and Chapters 5 - 8*
(a) the existence of the development;	
(b) the use of natural resources;	
(c) the emission of pollutants, the creation of nuisances and the elimination of waste, and the description by the applicant of the forecasting methods used to assess the effects on the environment.	
5. A description of the measures envisaged to prevent, reduce and where possible offset any significant adverse effects on the environment.	*Chapter 2 and Chapters 5 - 8*
6. A non-technical summary of the information provided under paragraphs 1 to 5 of this Part.	*Volume 2*
7. An indication of any difficulties (technical deficiencies or lack of know-how) encountered by the applicant in compiling the required information.	*Chapter 2 and Chapters 5 - 8*
PART II	
1. A description of the development comprising information on the site, design and size of the development.	*Chapter 3*
2. A description of the measures envisaged in order to avoid, reduce and, if possible, remedy significant adverse effects.	Chapter 2 and Chapters 5 - 8
3. The data required to identify and assess the main effects which the development is likely to have on the environment.	Chapter 2 and Chapters 5 - 8
4. An outline of the main alternatives studied by the applicant or appellant and an indication of the main reasons for his choice, taking into account the environmental effects.	*Chapter 3*
5. A non-technical summary of the information provided under paragraphs 1 to 4 of this Part.	*Volume 2 of the ES*

2.3.2 In light of the above, it is considered that the ES is fully compliant with the requirements of the EIA regulations.

2.4 Structure of the Environmental Statement

2.4.1 The format of the ES is described below.

2.4.2 Volume 1 (Main Report) provides an introduction to the project and details the technical assessments that have been undertaken to determine the likely impacts of the project. The chapters of the Main Report are as follows:

Chapter 1.0: Introduction and Background
Chapter 2.0: Scope of the Environmental Impact Assessment
Chapter 3.0: Scheme Description
Chapter 4.0: Planning Policy Context and Appraisal
Chapter 5.0: Landscape and Visual Impact
Chapter 6.0: Noise and Vibration
Chapter 7.0: Air Quality
Chapter 8.0: Energy Export Connections
Chapter 9.0: Summary of Effects

2.4.3 Following the chapters identified above are associated figures and a series of technical appendices. These include details of the methodology and information used in the assessment, detailed technical schedules and, where appropriate, raw data.

2.4.4 The Environmental Statement covers a large number of issues and, in doing so, uses a significant quantity of technical terms. Consequently, all the chapters are summarised in a Non-Technical Summary (bound separately as Volume 2) to provide a review of the development proposals, and the possible environmental implications, in concise lay terms.

2.4.5 The information and knowledge required to produce this ES was acquired from a number of varied sources to ensure that all impacts, whether explicit from the outset, or coming to light during the project's development, were assessed. These sources included discussions with technical consultees:

- Reference to the environmental studies carried out in support of the planning application for the consented waste facility;
- Review of public files and records;
- Review of historical mapping and aerial photography;
- Site surveys;
- Specialist studies, such as computer modelling of potential noise impacts; and
- Expert knowledge from the consultancy team.

3.0 SCHEME DESCRIPTION

3.1 Introduction

3.1.1 This Chapter provides a description of the layout and design of the proposed development, together with details regarding its construction and operation.

3.1.2 As described briefly within the introduction, NES's proposals are effectively twofold. The first part of the proposal is to replace the internal biostabilisation process within the consented waste facility with a mechanical process aimed at the recovery of recyclable material and the production of RDF. This part of the overall process is referred to as the 'fuel preparation facility'. The second part of the proposal (and the part to which planning permission is sought) is the development of an ATT plant on the area that currently benefits from planning permission for the development of a screening hall, link building and control room.

3.1.3 The fuel preparation facility would receive mixed residual municipal waste collected within the SBC administrative area, from which, it would produce 24,000tpa of RDF for use in the proposed ATT plant. In addition to RDF, the fuel preparation facility would also produce material for recycling including metal, plastic and inert material that may be re-used as aggregate. All RDF used within the ATT plant would have been 'pre-treated' in the fuel preparation facility in accordance with the national Zero Waste policy.

3.1.4 The ATT plant would utilise two processes to create an energy-rich gas ('syngas') from the 24,000tpa of RDF produced in the fuel preparation facility, these would comprise:

- **Pyrolysis**: which is the heating of material in the complete absence of oxygen to produce both a product 'syngas' and a carbon rich solid material called char; and
- **Gasification**: the treatment of char using steam and limited amounts of oxygen at high temperature to produce gasification gas and inert ash.

3.1.5 The product gas would be directed to one of four gas engines which, in combination, would be capable of generating, in combination, circa 2.9 MWe

of electricity of which circa 2.7 MWe would be available (after parasitic loads are taken into account) for supply to the local electricity supply grid. The plant would also incorporate equipment to recover heat released by the gas engines, both from their cooling circuits and from their exhausts. This would be capable of supplying hot water to the proposed Langlee district heating system (see the Heat and Power Plan in Part 3 of the planning application document for further details). In combination up to 4.5 MWth of heat could be supplied by the facility, although the precise amount would vary from time to time according to demand. The quantity supplied to the District Heating scheme will average 1.2 MWth (following completion of the scheme). Heat would also be used within the fuel preparation facility to recover recyclable material from the waste and for preparing RDF.

3.1.6 In light of the above, the facility would give rise to a significant number of benefits including a contribution towards the delivery of sustainable waste management (in accordance with the Zero Waste Plan) and in particular, combating climate change through the provision of low carbon and renewable energy production.

3.1.7 It is anticipated that the fuel preparation facility and the ATT plant would be built in 2014 and commissioned in early 2015.

3.2 Permanent Development

3.2.1 The proposed ATT plant development would be based around two inter-connected buildings comprising an 'advanced thermal conversion building' and an 'energy recovery building'. In-turn, these buildings would be connected to the main building associated with the fuel preparation facility. In addition to the two main buildings, the plant would also include a number of ancillary structures to the east and north east. An internal access road and associated service yard are located within the northern part of the site.

3.2.2 The proposed development (including the consented development associated with the fuel preparation facility) is illustrated in plan form on Figure 3.1 and elevation form on Figures 3.2 – 3.5.

3.2.3 The advanced thermal conversion building would contain the fuel handling and feed systems, the pyrolysis and gasification units (producing syngas from the RDF) and syngas clean-up equipment (including quench, scrubber and ceramic filter). The building would have a total length of circa 64m and would be between circa 13m and 11.6m wide and would extend to a maximum ridge height of 10m. On both the eastern and northern elevation, facing the proposed yard area, would be a metal roller shutter door.

3.2.4 The energy recovery building would contain the CHP engines for the combustion of syngas / generation of renewable energy. It would have a total length of circa 40m and would be circa 24.5m in width and it would have a ridge height of 11.9m. On the northern elevation, facing the proposed yard area, would be 2 metal roller shutter doors.

3.2.5 Both of the proposed buildings would be of a portal frame construction and have profiled metal roof and wall cladding sheets with PPC coating in olive green (RAL6003). The roller shutter doors on the proposed buildings would also be the same colour.

3.2.6 The main exhaust associated with the proposed gas engines would be located immediately to the north of the energy recovery building. The exhaust would be 23m in height and 1.2m in diameter and would contain 5 separate flues, one for each CHP engine and one for exhaust emissions from the post gasifier combustion units. The exhaust will be Granite Grey (RAL7026) in colour.

3.2.7 The ancillary structures and plant associated with the facility comprise:

- Emergency gas flare – this would be situated to the immediate east of the biofilter building and would measure circa 9m high x 1.3m in diameter. The gas flare would only be utilised in the event of an emergency shutdown. As such, it would be used very infrequently. The flaring itself would be undertaken within an internal chamber in the flare stack and thus there would be no visible flame when operational;
- Gas buffer tanks – comprising 2 no vertical cylinders measuring circa 2.3m diameter by circa 9.27m high;

- Biofilter and biofilter exhaust – the biofilter would be contained within a black plastic coated fabric structure within a galvanised metal frame, the structure would measure 37m long x 16.2m wide x 3.5m high (to eaves) and 4.5m to ridge. The biofilter exhaust would be situated to the immediate east of the structure and would be 2.2m in diameter and 11.4m high. All air ventilated from the fuel preparation and energy buildings would be treated in the biofilter as part of the plants odour control system;
- Bunded storage tanks - 3 no cylinders, each measuring circa 10m in diameter and 6.8m in height. All would have a granite grey finish (RAL7026);
- Four Air Blast Chillers;
- Transformers; and
- Bunded oil tanks.

3.2.8 As can be seen from Figure 3.1 the proposed ATT plant would utilise the vehicular access, car parking, security fencing and gates and the overall development platform proposed as part of the consented waste facility. As a consequence, these elements of the wider development fall outside the remit of this planning application and are not described in any more detail. Notwithstanding, a description has been provided regarding the layout and design of the following ancillary infrastructure / features which would (potentially) require amendment as a result of the ATT plant development:

- Drainage;
- Lighting; and
- Landscaping.

Drainage

3.2.9 The proposed ATT plant development would give rise to surface water run-off from roads, vehicle parking areas, building roofs, hard-standings and hard landscaped areas. However, the proposals would not result in a material increase in the overall area of hardstanding when compared to the consented waste facility and thus, should not result in a measurable increase in the amount of water requiring attenuation.

3.2.10 In light of the above, whilst the design of the overall system (i.e. the precise location of some of the downpipes, underground pipework, drains etc.) may vary slightly from the consented scheme, the principles of the surface water drainage for the consented scheme should still apply. Accordingly, no further micro-drainage calculations / flood risk assessments are required in connection with the proposed ATT plant development.

3.2.11 With regard to the final design of the drainage infrastructure associated with the ATT plant and how this connects into the consented scheme, it is considered that this could be the subject of a suitably worded planning condition.

Lighting

3.2.12 Once commissioned the proposed ATT plant would operate on a continuous basis. During hours of darkness there would be lighting commensurate with health and safety requirements to ensure a safe working environment for operatives on site.

3.2.13 The lighting proposals would be based upon the same principles as the lighting scheme submitted pursuant to the discharge of Condition 4 of the planning permission for the consented waste facility. This sought to:

- Minimise use and lighting levels to that required for operational purposes;
- Maximise efficiency (though appropriate spacing, selection of appropriate equipment to meet specified lighting levels and electrical efficiency);
- Minimise light spill (through orientation and selection of appropriate equipment).

3.2.14 The proposed lighting scheme for the ATT plant would be similar to that described below:

- There would be no lighting of external facades;
- Lighting of external yard and parking areas would use modern flat glass lanterns which achieve full ‘cut-off’, meaning that all of the light shines

down with minimal upwards or sideways spill. The lit surfacing would not materially extend beyond the operational boundary of the site;

- The full external lighting system would only operate during hours of darkness when vehicle deliveries / operations are occurring during the normal working day. After this time, the main lighting would automatically be switched off. In order to cater for the health and safety needs of night shift workers at the plant, a reduced, low level lighting system would remain in operation after dark; and
- The internal operational areas of the facility would be lit to provide a safe working environment according to task in specific working areas, rather than to provide a consistent light level. In addition, there are no windows within the buildings. This approach would ensure that light spillage from within the plant would be kept to a minimum.

3.2.15 Whilst a full assessment of the lighting scheme has not been provided in support of this planning application, it is clear from the information submitted pursuant to the discharge of Condition 4 of planning permission for the consented waste facility that an appropriate solution can be established at the site. To this end, it is suggested that detailed lighting design for the ATT plant is the subject of a planning condition.

Landscape Proposals

3.2.16 A landscape scheme has already been implemented in connection the consented waste facility development. This includes both deciduous and coniferous tree and shrub species on the bund at the southern edge of the wider waste management site. This planting is intended to tie in with the existing planting present on the bund to form a visual screen to views from the south. A meadow mix, including wildflowers would be seeded on the localised earthworks that are associated with the consented waste facility.

3.2.17 It is not proposed to change the fundamentals of the landscape scheme as part of the proposed ATT plant development. Minor changes to the layout of meadow areas have been made to reflect the change in building footprint. These changes to the landscape scheme are shown on Figure 5.3.

3.2.18 As the consented landscape scheme includes planting of Ash trees (which were planted during 2012), management and maintenance of the planting should include regular monitoring of Ash, in order to inspect for the presence of Ash dieback. It is recommended that management and maintenance operations accord with current best practice guidance available via the Forestry Commission website and with any subsequent changes to this guidance. Where failures of Ash specimens occur, these should be replaced with alternative species, as indicated on Figure 5.3.

3.3 Proposed Site Operations

3.3.1 The following text describes the operations and processes that would be undertaken at the proposed ATT plant.

The ATT Plant Process

Process Overview

3.3.2 The ATT plant would generate renewable energy using a proven advanced thermal treatment technology, specifically a staged pyrolysis and gasification process to generate synthesis gas (syngas), followed by a power generation facility using CHP engines to generate renewable electricity for export to the local supply network, and renewable heat for third parties in the form of hot water.

3.3.3 The facility would consist of four individual pyrolysis / gasification modules with CHP energy recovery using gas engines. It is expected that only three of the units would be in operation at any one time, with the fourth unit providing standby to ensure that the facility can operate at 100% of the availability needed to satisfy the RDF duty.

3.3.4 The ATT plant would meet the immediate opportunity to recover renewable low carbon energy from residual waste and contribute towards the diversion of waste from landfill.

Detailed Process Description

3.3.5 The thermal treatment of RDF within the ATT plant would be carried out utilising a series of processes these can be summarised as:

- Fuel feedstock preparation *(in the Fuel Preparation Facility);*
- Fuel handling and feed system;
- Advanced thermal treatment process and energy recovery;
- Residue handling; and
- Controls and monitoring.

3.3.6 Each of the aforementioned stages of the renewable energy generation process within the ATT plant is described in more detail below. A process flow diagram for both the fuel preparation facility and ATT plant is provided in Figure 3.6.

Fuel Feedstock Preparation

3.3.7 Fuel preparation would occur within the consented waste facility / fuel preparation facility. A series of mechanical processes within the building would:

- Remove recyclable material and rejects (items not suitable for the ATT process) from the incoming waste material; and
- Process RDF to the correct size, moisture content and calorific value for subsequent thermal treatment.

3.3.8 The processes undertaken within the consented waste facility will produce circa 24,000tpa of material for the ATT plant.

Fuel Handling and Feed System

3.3.9 RDF transferred from the fuel preparation facility would pass into a fuel store contained within the reception area of the advanced thermal conversation building, forming part of the ATT plant. Access to this reception area would also be available (via a roller shutter door) for direct delivery of either loose or baled RDF. A bale splitter would be located in the reception area to enable baled waste to be processed and added to the buffer store.

3.3.10 The RDF would then be continuously fed into individual pyrolyser buffer stores which have the capacity to contain approximately 60 minutes of fuel (1 tonne for each of the four lines). The buffer store material would be fed continuously into each pyrolyser unit. The filling of each unit would be carried out by feed compactors (2 per unit) on a 24/7 basis. The purpose of the compactors is to prevent the ingress of air into the pyrolysis process.

Advanced Thermal Conversion Process and Energy Recovery

3.3.11 The RDF would pass through three distinct processes in the ATT plant:

- Material drying – where moisture is driven off in the first portion of the pyrolysis tube;
- Pyrolysis – where thermal decomposition of the material and its by-products takes place to produce syngas (consisting of methane, hydrogen, carbon monoxide and water vapour), and residual material, in the form of solid carbon char;
- Gasification – where the carbon char product of pyrolysis is gasified, leaving an inert ash and gasifier gas. High temperature steam is injected into the gasification unit, together with a limited amount of oxygen. This converts the char into gas and a residual ash. The ash residue from the gasification of the char would be removed and taken off-site for either disposal or re-use where possible.

<u>Pyrolysis</u>

3.3.12 From the compactors in the pyrolyser buffer stores the RDF material would be continuously fed into the pyrolyser units where it would initially be the subject of a material drying process to reduce moisture content. It would then be transferred into the first part of the pyrolysis chamber, which would be heated to a temperature of 850-1,000°C. The retention time within the chamber would vary, but typically the RDF would remain in the chamber for circa 40 minutes. The ability to vary the temperature and residence time of the fuel within the pyrolysis chamber allows the process to take account of variability in the composition of the RDF.

3.3.13 The gas and char from the pyrolysis process would be drawn, under negative pressure, through a ceramic filter to remove particulates and to collect the char arising from the pyrolysis process. From there, it would pass through an aqueous quench, to rapidly reduce the temperature of the gas and to condense out any tars and oils and prevent the formation of dioxins. This quench would neutralise and remove acid gases.

3.3.14 Once filtered and quenched the syngas would be passed into a buffer store, where gas from each pyrolysis unit would be blended to ensure homogeneity of the gas. From here, the gas would be fed into one of four CHP engines (one per line), for the generation of renewable energy (heat and electricity).

3.3.15 It is anticipated that only three of the four CHP engines would be in operation at any one time, as they are most efficient when they are operating near to their full output. The waste heat from the engine exhaust gas and engine manifold would be captured using heat exchangers for reuse in the fuel drying process and also for supply to a proposed local heat distribution network. Further discussion regarding the proposed heat network is provided in the Heat and Power plan contained within Part 3 of the PAD.

3.3.16 The flexibility of the CHP engines and their ability to provide heat for the drying process means than an external, fossil fuel powered source for this process is not required save for during start-up and shut down. Using a proportion of the energy in this way replaces the use of fossil fuels. The engines are small scale and modular, so that the amount of heat required for the district heating network can be adjusted, to match changing demands from the District Heating network. Bottled propane gas will be used for start-up and shut down of the process.

Gasification

3.3.17 The char and particulates that would be collected in the ceramic filter following the pyrolysis process have a residual chemical energy. The purpose of the gasifier is to process this material in order to release the potential of this energy as gasification gas. The gasification of the pyrolysis char would be achieved through the injection of a controlled ratio of steam and air into a

bed of char within the gasification chamber (the chamber would be continually filled by the char feed system). The resultant gas - the 'gasifier' gas would then be combusted in order to provide recovered indirect heat to the pyrolysis process to release the pyrolysis gas and therefore form part of a self-sustaining process.

3.3.18 The use of the renewable gasifier gas to power the pyrolysis process would replace the need for fossil fuels, such as natural gas. The exhaust from the gasification process passes through a 'cyclone' and a bag filter prior to being released as an exhaust emission in the main exhaust (see below for further details). The exhaust emissions for the gasifier would be regulated in accordance with the requirements of the Industrial Emissions Directive 2010/75/EU (IED). The other by-product of the gasification process is a fine ash materials referred to as 'fly-ash'. This would be collected in the cyclone and subsequently disposed of at a suitably permitted facility.

3.3.19 Pyrolysis gas produced in the pyrolysis units and cleaned and cooled in the ceramic filter and quench is expected to pass an "end of waste" test and thus the Industrial Emissions Directive 2010/75/EU (IED) does not apply to these emissions.

Exhaust Emissions

3.3.20 Following the syngas combustion process, CHP exhaust gas would be passed into the exhaust, which would stand at a height of 23m, would have an internal diameter of 1.2m and would contain 5 separate flues. Four of the flues would be the emission point for each of the 4 CHP gas engines; the other would accommodate all of the exhaust emissions from the post gasifier combuster units.

3.3.21 In addition to the main exhaust, a separate emergency flare stack is also proposed. This would operate rarely as described previously in this scheme description.

Operations

3.3.22 It is anticipated that on average three of the four ATT units and three of the four gas engines would be operating at full capacity for 8,000 hours per year. This will enable the "stand-by" unit to be brought on line as operating units are closed down for maintenance or repair. The anticipated throughput of 24,000 tonnes annually represents circa 1 tonne per hour through each operational machine.

Energy Recovery

3.3.23 One of the major benefits of the proposed ATT plant would be the ability to recover energy by way of electricity and heat production.

3.3.24 The electrical output of the gas engines would be an estimated 24,000 megawatt hours per year (MWh/yr) of electricity. The majority would be exported to the local grid with a small parasitic load being used to operate the plant itself. The thermal output of the ATT plant would be around 4.5 MWth, of which 1.2 MWth on average would be supplied to the District Heating system when it is developed fully as set out in the Heat and Power Plan (Part 3 of the PAD).

3.3.25 The electricity generated by the facility would supply the local supply grid. The off-take and local use of renewable heat has been considered in light of the requirements of SEPA's Thermal Treatment of Waste Guidelines 2009, as amended. To that end, a Heat and Power Plan has been prepared, which is contained within Part 3 of the (separately bound) Planning Application Document.

3.3.26 The Heat and Power Plan seeks to achieve the optimum efficiency level for the energy plant, taking into account local heat requirements and opportunities. Due to the nature of CHP engines, this is a flexible renewable energy facility that can supply base load electricity and heat demand as well as catering for peak demand. This will also take seasonality of demand into account. The Heat and Power Plan will enable the on-site heat recovery and

direct supply of heat to customers or proposed local networks to be maximised.

3.3.27 As emphasised in the Heat and Power Plan there is a considerable opportunity for the distribution of heat form the facility as part of a proposed district heating network.

Residue Handling

3.3.28 Approximately 3,500 tonnes per annum of ash is expected to be generated by the gasification process. The ash would be removed from the gasifiers by a sealed auger system designed to prevent ingress of air into the system. Once removed from the gasifiers, the ash would be transferred to a conveyor system via an ash bath system; this would cool the ash down to below 50 ^{0}C and prevent the generation of dust. The cool / damp ash would be discharged into an ash buffer store before being transported from the facility.

3.3.29 NES are committed to the establishment of markets for the waste ash including secondary aggregate production. As a fall-back in the case where a suitable secondary aggregate off-take is unavailable the ash residue could be transferred directly to the Easter Langlee landfill site (operated by SBC and located directly adjacent to the proposed ATT plant) for disposal. The ash is likely to be inert and therefore suitable for landfill disposal at this site.

3.3.30 The residues from the treatment of the syngas would primarily comprise the sludge and tar collected in the quench (part of the syngas filter). It is currently proposed that this material would be introduced into the gasifiers to recover its energy. In addition, it may also be possible to re-use the residues in some industrial processes although a market has yet to be been found in the UK. Any aqueous effluent from the quench process would be removed from the site by tanker for disposal to an appropriately licensed waste treatment plant (an acceptable disposal point would be a local sewage treatment works).

Controls and Monitoring

3.3.31 The ATT plant would be operated from the control room which would overlook the pyrolyser / gasifier units. A CCTV system would allow operators to view other areas of the plant, such as the waste reception and storage areas, driers and the ash storage areas. A Continuous Emission Monitoring System (CEMS) would be installed which would take continuous samples from the exhaust and analyse them against the requirements of the Pollution and Prevention Control (PPC) permit for the site. This would be linked to the waste feed system to ensure that the CHP plant would be shut down in the event that there is an abnormal operation and during start-up or shutdown.

Employment

3.3.32 The ATT plant and associated fuel preparation facility would provide permanent employment for between 30 – 40 staff. They would work in shifts to maintain a 24-hour / 7-day per week cover. The majority of employees would be skilled operatives (electricians / fitters) or technical engineers (control and plant).

Hours of Operations

3.3.33 The ATT plant and associated energy generation equipment would operate 24 hours per day, 7 days per week, 365 days per year except during planned maintenance shut-downs.

3.3.34 Deliveries of waste material to fuel preparation facility would be the same as those for the consented waste facility.

3.4 Construction

3.4.1 The following section provides a summary of the key elements of the ATT plants construction. It is not intended to be prescriptive and the exact construction methods, phasing and programme would be determined by the appointed contractor. However, the following description should enable the key environmental effects of the development to be assessed.

3.4.2 It anticipated that the ATT plant would be constructed at the same time as the adjacent fuel preparation facility. The construction activities described below reflect this position.

Programme

3.4.3 Subject to obtaining the necessary planning permission, permits and licenses, it is currently anticipated that construction work would commence in early 2014. It would take approximately 12 - 18 months to complete construction, installation and to commission the plant. On this basis, the programmed commencement of full operations is early / mid 2015.

3.4.4 The initial works would comprise site preparation / remediation and groundworks including site clearance, earthworks, foundations and preliminary laying of site drainage (works would be undertaken to avoid the bird breeding season). This would be followed by the erection of the main structural building frames and cladding. Following the completion of the building envelopes, the installation of plant and equipment would take place, followed by a period of commissioning. The final activities would be external works, including hardstandings, roads, installation of lighting, signage and landscaping which would be undertaken in parallel to the final installation and commissioning of plant.

3.4.5 All of the construction works including site compound, materials storage, car parking and plant assembly would be managed within the boundaries of SBC's landholdings at Easter Langlee (adjoining the site subject to this planning application and the adjacent site of the consented waste facility).

Construction Staff

3.4.6 The construction of the ATT plant and associated fuel preparation facility would provide temporary employment, for up to approximately 80 personnel at the peak of construction activity, albeit the number of site operatives employed would vary throughout the construction period with peak

construction staff numbers occurring during the plant installation and fit-out periods.

Construction Hours

3.4.7 Construction operations would generally be limited (Monday to Friday, 07.00 to 19.00hrs and Saturday 07.00 to 14.00hrs). It is possible that some construction activities would be undertaken outside these hours e.g. during the internal fit out of buildings, delivery of abnormal loads.

3.4.8 HGV movements would not be permitted outside the hours outlined above without prior agreement from SBC and operations would not exceed any noise limits imposed as part of the planning permission or any conditions attached thereto.

Site Access

3.4.9 Site access would be from B6374 Galashiels to Gattonside Road to the south and Langshaw Road. It is anticipated that a limited number of abnormal loads would be required during the construction period. The local roads leading to the construction site have been assessed as being suitable for the transport of abnormal loads and widening and strengthening of highways is not considered necessary.

3.4.10 If there is a requirement for abnormal loads to be delivered outside the normal working hours described above, then permission shall be sought from SBC.

Site Compound and Operative Facilities

3.4.11 The main site compound would be located within the land associated with the wider Easter Langlee site. This would comprise the site offices, staff welfare facilities, staff parking as well as being used for the temporary storage and lay-down of materials and plant. Further material storage and lay-down areas would be provided within the site boundary, as necessary.

3.4.12 Appropriate bunding and environmental protection measures would be implemented within the fuel and material storage areas situated within the construction site. The protection measures would be defined in the Construction Environmental Management Plan (CEMP) and would be in line with SEPA's Pollution Protection Guidelines.

3.4.13 A wheel wash facility would be located at the site exit during all activities that could generate material being carried on to the public highway. The wheel washing facility would be self-contained with an integral pump house and internal settlement collection tank. The wheel wash would comprise high-pressure water hoses and a power washer hand lance.

Plant

3.4.14 It is anticipated that the following items would be the principal plant used during the construction period:

- Tracked excavators (excavation and loading);
- Articulated dump trucks;
- Wheeled backhoe loaders;
- HGV wagons;
- Piling rigs;
- Mobile cranes and telescopic handlers;
- Rollers and vibratory compactors;
- Generators and water pumps; and
- Concrete mixer trucks.

Main Construction Activities

3.4.15 The key construction phases of the project are described below. The construction activities are set out in the likely construction sequence. However, it is expected that a number of the operations would overlap and the construction of various elements of the main buildings would be staged throughout the construction period.

Site Preparation, Remediation and Groundworks

3.4.16 The perimeter of the site would be secured for the duration of the construction works by 2.4m high fencing. The site access would be gated and manned 24-hours. Security would operate throughout the construction period.

3.4.17 Surface water pollution protection measures would include the use of temporary settlement / storage lagoons prior to the discharge of surface water from the site.

3.4.18 Vegetation clearance on the site would involve the removal of any immature trees and areas of scrubby grassland, noting that the majority of the site comprises bare ground. Vegetation clearance would be undertaken outside the bird breeding period (April – September) and would take into account any other ecological constraints identified at the site. On completion of vegetation clearance the groundwork's would commence through the re-grading the site to the required levels and the construction of the development platform. If any remediation of potentially contaminated materials is required, this would be carried out at this stage either by treatment on site or disposal a suitably-licensed landfill facility.

3.4.19 Foundations for the frame of the main building are likely to be founded using a piled solution. The final piling method will be determined by the selected piling contractor but preliminary analysis would indicate either a cast in-situ concrete pile or a driven pre-cast concrete pile would be most appropriate.

3.4.20 Foundations for the ancillary buildings including the weighbridge, are likely to be based upon raft, strip or pad footings.

3.4.21 Building slabs would be cast in-situ and concrete would be delivered directly to the site via a concrete mix lorry.

Main Structural Works

3.4.22 The main buildings would be of steel frame construction with the external envelope formed from a combination of cold rolled sheeting rails and profiled

metal cladding. The roofs of the buildings would be constructed from composite profiled metal cladding panels and will include translucent roof lights.

3.4.23 Steelwork would be delivered to the site by HGV. The construction is likely to be undertaken using a series of mobile cranes

Installation and Commissioning of Plant

3.4.24 The installation of the main plant and equipment would commence following the completion of the main building envelopes.

External Works

3.4.25 The majority of the external civil engineering works would be likely to be undertaken towards the end of the main construction works in parallel with the installation of plant and the commissioning period. The works would comprise the laying of access roads, the car park, external hardstanding areas to the buildings and earthworks associated with the final landscape scheme.

3.4.26 The laying and installation of drainage and utilities (including service runs to enable the district heating scheme) would be phased with much of the work being undertaken in the early phases of the project. Connections and finishing of service runs are likely to be undertaken towards the end of the construction phase.

3.4.27 It is likely that the external grid connection works i.e. the construction of the cable route, cabling and any ancillary works e.g. reinforcement of substations would be undertaken by the District Network Operator (DNO). This work would be undertaken in parallel with the plant installation and commissioning operations.

Construction Environmental Management Plan (CEMP)

3.4.28 A CEMP would be developed for the construction period, the purpose of which would be to manage and report environmental effects of the project during construction. The CEMP would set out how environmental issues would be managed in accordance with relevant legislation, regulations and best practice guidance. It would be the responsibility of the main contractor to develop and enforce the CEMP.

3.4.29 The objectives of the CEMP would be to:

- Highlight environmental impacts resulting from the development and identify sensitive receptors within the development site to the construction team;
- Reduce and manage environmental impacts through appropriate construction methods;
- Reduce and manage environmental impacts through implementing environmental best practice and the Remediation Strategy during the construction period;
- Undertake on-going monitoring and assessment during construction to ensure environmental objectives are achieved;
- Provide emergency procedures to protect against environmental damage;
- Provide an environmental management structure for the construction stage;
- Recommend mechanisms to reduce risks of environmental damage occurring; and
- Consult and liaise with SEPA, SNH, Local Authority Officers and other stakeholders throughout the works if necessary.

3.4.30 A CEMP for a project of this nature would typically cover the following key elements:

- Drainage, water quality and hydrology;
- Dust, emissions and odours;
- Noise and vibration;
- Health and safety / site management;
- Site Waste management;

- Construction traffic management;
- Wildlife and natural features;
- Cultural heritage;
- Contaminated material; and
- Pollution control and emergency / contingency procedures.

3.4.31 Prior to the commencement of construction an environmental walkover ecological survey would be undertaken to establish any changes in the environmental baseline and update any of the defined construction procedures as necessary.

3.4.32 Detailed construction method statements would be developed for the key construction phases e.g. site preparation and development of site compound, foundations and piling activities. The method statements would outline the key construction processes, identify potential environmental and health and safety risks and define appropriate mitigation measures.

3.4.33 The main contractor would take regard of the Remediation Strategy and the following guidelines in the preparation of the CEMP and during the operation of the site:

- Pollution Prevention Guidelines 1: General Guide to the Prevention of Pollution (PPG1), SEPA;
- Pollution Prevention Guidelines 2: Above Ground Oil Storage Tanks (PPG2), SPEA;
- Pollution Prevention Guidelines 3: Use and Design of Oil Separators in Surface Water Drainage Systems (PPG3), SPEA;
- Pollution Prevention Guidelines 4: Disposal of Sewage where no Mains Drainage is Available (PPG4), SPEA;
- Pollution Prevention Guidelines 5: Works and Maintenance in or near water (PPG5), SEPA;
- Pollution Prevention Guidelines 6: Working at Construction and Demolition Sites (PPG6), SEPA;
- Pollution Prevention Guidelines 7: Safe Storage – The Safe Operation of Refuelling Facilities (PPG7), SEPA;
- Pollution Prevention Guidelines 8: Storage and Disposal of Used Oils (PPG8), SEPA;

- Pollution Prevention Guidelines 13: Vehicle Washing and Cleaning (PPG13), SEPA;
- Pollution Prevention Guidelines 21: Pollution Incident Response Planning (PPG21), SEPA
- Pollution Prevention Guidelines 22: Incident Response – Dealing with Spills (PPG22), SEPA;
- CIRIA. Culvert Design Guide C168 (1997);
- CIRIA. Control of water pollution from construction sites C532 (2001); and
- CIRIA. Environmental Good Practice on Site C692 (2010).

3.5 Energy (Heat & Power) Connectivity

3.5.1 As outlined above, the ATT plant would recover energy from the utilisation of syngas by way of heat and electricity production. A separate Heat and Power Plan (HPP) has been prepared in support of the application (see Part 3 of the, separately bound, Planning Application Document). This sets out the currently defined proposals / opportunities for heat and power export, together with the steps required to maximise benefits in this regard.

Heat Connectivity

3.5.2 The HPP has identified 13 existing heat users and 6 potential future heat off-take opportunities within close proximity to the ATT plant site. The location of the identified heat off-take opportunities and potential routeing of a heat pipe network is illustrated on Figure 8.2 (and in the HPP). The heat pipe network and associated infrastructure does not form part of the planning application for the proposed ATT plant and would be authorised by either a separate planning application, or through permitted development rights. However, on the basis that export of heat is an integral part of the scheme, it is considered appropriate that the potential environmental impacts associated with the delivery of the heat pipe network are assessed within the ES (refer to Chapter 9.0).

Electricity Connectivity

3.5.3 Similar to the heat pipe network, the grid connection works required to export electricity from the facility do not form part of the planning application and would be authorised either under a separate formal consenting process, or under permitted development rights, depending on the nature of the connection.

3.5.4 The applicant has consulted with the local Distribution Network Operator (DNO) to identify potential grid connection options. The DNO has confirmed that a connection is available.

3.5.5 The most likely connection would be to an 11kV connection from a new 11kV switching station in the vicinity of the Tweed Road / Winston Road, Galashiels. This would be an underground connection that would comprise of a circa 2.8km route that would be established via underground cabling below the exiting highway and highway verge network and will include a trenchless river crossing. The precise routing would be determined during the detailed design phase (details of the proposed route are provided in Figure 8.1).

3.5.6 An assessment of the potential environmental impacts of these connection options is provided in Chapter 8.0.

3.6 Alternatives Considered

3.6.1 The requirement to consider alternatives stems from the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2011. Schedule 4 of the Regulations identifies the information for inclusion in Environmental Statements. Parts 1 (2) and 2 (4) include: *"An outline of the main alternatives studied… and an indication of the main reasons for this choice, taking into account the environmental effects".*

3.6.2 Paragraph 95 of Circular 3/2011 which accompanies the former Environmental Impact Assessment (Scotland) Regulations 2011, notes that: *"Where alternative approaches to development have been considered, paragraph 4 of Part II of Schedule 4 requires the applicant to include in the*

ES an outline of the main alternatives, and the main reasons for his choice. Although the Directive and the Regulations do not expressly require the applicant to study alternatives, the nature of certain developments and their location may make the consideration of alternative sites a material consideration. In such cases, the ES must record this consideration of alternative sites. More generally, consideration of alternatives (including alternative sites, choice of process, and the phasing of construction) is widely regarded as good practice, and resulting in a more robust application for planning permission. Ideally, EIA should start at the stage of site and process selection, so that the environmental merits of practicable alternatives can be properly considered. Where this is undertaken, the main alternatives considered must be outlined in the ES."

3.6.3 As is evident from the above, there is no formal requirement for applicants to consider alternatives, rather the imperative is to outline any main alternatives where (i.e. if) they have been considered. In the case of this planning application, there is considered to be a particularly strong justification for the site that has been selected, the technologies that have been adopted and the approach to scheme design and as such, there has not been further consideration of alternatives.

4.0 PLANNING POLICY CONTEXT AND APPRAISAL

4.1 Introduction

4.1.1 This chapter of the ES undertakes an analysis of the proposed development in the context of all relevant planning policy and guidance. Following on from this introduction sub-section 4.2 provides a detailed (tabulated) assessment of how the proposals accord or otherwise with the relevant planning policy framework and sub-section 4.3 draws a series of concise conclusions.

4.1.2 A full description of the European, national and local planning policy and strategy that is of relevance to the proposed ATT plant development is provided in Appendix 4-1. Reference should be made to this appendix when reviewing the tabulated planning policy analysis contained within sub-section 4.2 below.

The Development Plan

4.1.3 Sections 25 and 37(2) of the Planning (Scotland) Act 1997 (as amended by The Planning Etc (Scotland) Act 2006) indicate that in determining planning applications the relevant, determining authority should have regard to the provisions of the development plan, in so far as it is material to the application, and to any other material considerations.

4.1.4 The Planning etc. (Scotland) Act 2006 introduced a new planning policy framework comprising:

- Strategic Development Plans (SDPs); and
- Local Development Plans (LDP).

4.1.5 In the context of this planning application, neither the SDP nor the LDP have been adopted, although both are actively being progressed.

4.1.6 The SBC has issued their LDP Main Issues Report (MIR) on the 2nd April 2012. This was the subject of a 12 week consultation which concluded on the 25th June 2012. Key programming dates identified within the SBC Local

Development Plan Scheme and Participation Statement indicate that publication of the proposed plan will be in the Spring of 2013.

4.1.7 With regard to the SDP, the proposed SDP for Edinburgh and South East Scotland (referred to as the SESplan) was submitted to Scottish Ministers for Examination on the 10th August 2012. The Directorate for Planning and Environmental Appeals (DPEA) has subsequently confirmed that the SESplan is in conformity with the Participation Statement and formal examination of the plan commenced on the 22nd October 2012. It is noted on the DPEA website that the examination is expected to be concluded within the Government target of 6-9 months.

4.1.8 On the basis that neither the LDP nor SDP have been formally adopted, the statutory Development Plan in respect of the proposed ATT plant development currently comprises:

- Scottish Borders Council Consolidated Local Plan (2011); and
- Scottish Borders Council Consolidated Structure Plan (2009).

Other Material Considerations

4.1.9 In addition to the policies of the statutory development plan, the proposal has also been considered in the context of a number of relevant material planning considerations, these are listed below.

National Planning Policy

- National Planning Framework 2, June 2009;
- Scottish Planning Policy, February 2010;

Emerging Development Plan

- Scottish Borders Council Local Development Plan - Main Issues Report, April 2012;
- Strategic Development Plan for Edinburgh and South East Scotland (SESplan) - Proposed Plan, October 2012.

European and National Waste Management Policy, Legislation and Guidance

- Revised Waste Framework Directive (2008/98/EC), 19 November 2008;

- Planning Advice Note 63: Waste Management Planning, February 2002;
- Scotland's Zero Waste Plan, June 2010;
- SEPA's Thermal Treatment of Waste Guidelines 2009 with May 2011 update;
- Scotland's Zero Waste Regulations, Policy Statement, October 2011;
- Waste (Scotland) Regulations 2012, May 2012;
- SEPA Guidance Note 6 Land Use Planning System, March 2012;

European and National Energy / Renewable Energy Policy, Legislation and Guidance

(UK Government Policy, as relevant within Scotland)

- Energy White Paper 'Meeting the Energy Challenge', May 2007;
- UK Renewable Energy Strategy, July 2009;
- UK Low carbon Transition Plan, July 2009;
- Renewable Heat Incentive, March 2011;
- UK Renewable Energy Roadmap, July 2011;
- The UK Carbon Plan: Delivering our Low Carbon Future, December 2011;
- Planning our Electric Future: A White Paper for secure, affordable and low-carbon electricity, July 2011;

(Scottish Government Policy)

- Planning Advice Note 45: Renewable Energy Technologies, January 2002;
- Biomass Action Plan for Scotland, March 2007;
- The Climate Change Delivery Plan: Meeting Scotland's Statutory Climate Change Targets, June 2009;
- Climate Change (Scotland) Act, August 2009;
- Renewables Action Plan, June 2009 and associated updates;
- Renewable Heat Action Plan for Scotland, November 2009;
- Energy from Waste Potential in Scotland, January 2010;
- Draft Electricity Generation Statement, March 2012;

- Low Carbon Scotland: Meeting the Emissions Reduction Targets 2010-2022, March 2011;
- 2020 Routemap for Renewable Energy in Scotland, including Sectoral Routemaps for Renewable Heat and Bioenergy and energy from Waste, July 2011; and
- Renewable Energy: The Renewables Obligation (Scotland) Order 2011 Consultation on Review of ROC Bands, October 2011.

4.1.10 It should be noted that various aspects relating to 'energy' constitute matters reserved to the UK parliament under Schedule 5 of the Scotland Act 1998. Accordingly, UK energy policy may be applicable in whole, principle or via arrangements through Memorandum of Understandings between the UK Government and devolved nations.

4.2 Planning Policy Appraisal

4.2.1 The policies and guidance described previously within this section and set out within detail within Appendix 4-1 have been assessed in terms of the application in Table 4.1 (below). The Table sets out the thrust of each of the relevant policies and assesses whether the development would help, be neutral to, or hinder the policy purpose / objective. For the purposes of this assessment where the development either helps or is neutral to the policy objective, no policy breach is deemed to occur. Comments are also made where appropriate.

Table 4.1: Assessment of the Proposal against Planning Policy and Guidance

Policy No.	Policy Thrust	Development helps policy	Development is neutral to policy	Development hinders policy	Comments
Statutory Development Plan					
Scottish Borders Council Consolidated Structure Plan 2009					
I17	Sets the provisions local plans should make in respect of waste management development.	✓			It is considered that the proposed development would accord with the requirements of the policy for the following reasons: • As demonstrated elsewhere within this

Policy No.	Policy Thrust	Development helps policy	Development is neutral to policy	Development hinders policy	Comments
					planning policy appraisal the proposed development would be in accordance with the requirements of the current national waste management strategy within Scotland. • The Area Waste Plan is superseded by both the National Waste Strategy, which itself is largely superseded by the Zero Waste Plan. Refer to Zero Waste Plan assessment below. The proposals would be entirely in accordance with the current waste management strategy for the Scottish Borders. • The proposed development would accord with the principles of sustainable waste management and would demonstrably assist in the management of SBC's residual municipal waste further up the waste hierarchy. • As demonstrated in this planning policy assessment the proposals would not give rise to any significant effects upon either the built or natural environment. Moreover, the development would ensure that less waste is disposed of at landfill, generate renewable low carbon energy and contribute to reductions in greenhouse gas emissions which in-itself would have further benefits to the safeguarding of the natural environment. • As demonstrated in this ES the proposals would not give rise to any significant effects upon the amenity of existing and planned developments in the locality, including the planned housing developments to the south and south west of the site.
I19	Supports the development of renewable energy sources that can be developed in an environmentally acceptable manner.	✓			It is demonstrated within this document that the proposed development would deliver a source of renewable energy in an environmentally acceptable manner. As such, the proposal would be in conformity with the requirements of this policy.
I22	Indicates that energy from waste installations will only be permitted where they are in accordance with the Area Waste Plan; represent the Best Practicable Environmental Option (BPEO) for the waste streams to be used and comply with all other relevant Structure Plan policies.	✓			As noted in the context of Policy I17 above, the Area Waste Plan is superseded by the National Waste Strategy, which itself is largely superseded by the Zero Waste Plan. In addition, the Concept of the BPEO is no longer a planning determinant in Scottish waste planning policy. As demonstrated elsewhere within this planning policy appraisal, the proposed ATT plant development would conform to the requirements of the Zero Waste Plan and all other current planning policy and guidance relating to energy from waste / renewable energy developments. In addition, as set out below, the proposal would also comply with the

Policy No.	Policy Thrust	Development helps policy	Development is neutral to policy	Development hinders policy	Comments
					other relevant policies within the Structure Plan. In light of the above, the proposals would be in conformity with the requirements of this policy.
S1	Requires that proposals for 'substantial development' are assessed against relevant sustainability criteria with the aim of minimising harmful environmental impacts / more sustainable development.	✓			As set out in the response to PAN 63 the ATT plant would accord with the principles of sustainable waste management and would be intrinsically sustainable though the generation of low carbon renewable energy (electricity and heat). As demonstrated throughout this ES the construction and operation of the proposed ATT plant would not give rise to any significant environmental effects. In light of the above, it is considered that the proposals would be in full confirming with the provisions of Policy S1.
N2	Seeks to prevent development that would have a significant effect on a designated or proposed Natura 2000 site, or a listed or proposed Ramsar site.	✓			The proposed development would not give rise to any indirect effects upon internationally / nationally protected ecological sites. The only potential impact that the development could have upon such features within the wider locality is through aerial deposition of pollutants from the proposed exhaust. As demonstrated in the air quality assessment contained within Chapter 7.0, the proposed ATT plant development would not give rise to any significant effects as a result of the aerial deposition of pollutants. As a consequence, the proposals would be in full compliance with the provisions of this policy.
N3	Seeks to prevent development proposals which will have an adverse effect, either directly or indirectly, on a Site of Special Scientific Interest.	✓			See response to Policy N2 of the Consolidated Scottish Borders Structure Plan above.
N5	Indicates that development that could have an adverse effect upon a locally important wildlife site, or on habitats or species identified for conservation action in the Local Biodiversity Action Plan, will only be permitted if it can be demonstrated that the benefits of the proposal clearly outweigh the intrinsic nature conservation value of the	✓			A comprehensive ecological impact assessment was submitted in support of the planning application for the consented waste facility. This concluded that: 1. The development site is not ecologically sensitive; 2. The development would not have the potential to affect either the River Tweed SAC/SSSI or Gorge SSSI; 3. There is evidence of badger and otter activity in the locality, but the development would not have the potential to affect either;

Policy No.	Policy Thrust	Development helps policy	Development is neutral to policy	Development hinders policy	Comments
	site, feature or area and its role in contributing to the development of regional habitat networks.				4. Works should be undertaken outside of the bird breeding season; 5. No negative effects would occur from the development as long as standard practise are followed. Condition 12 of the planning permission for the consented waste facility required that a species and habitat mitigation plan be submitted and approved in advance of development commencing. These details have been provided to SBC and the condition has subsequently been discharged. The proposed ATT plant would be developed on the same development platform as that proposed for the consented waste facility. It would also not materially alter the proposed drainage or lighting at the site. Thus, it would not give rise to any greater potential for direct or indirect effects on the local ecological resource in these regards. The only element of the proposed ATT plant that would have the potential to give rise to effects on ecological interests that would not have been assessed in connection with the consented scheme, is the aerial deposition of pollutants from the proposed exhaust. This has been assessed in detail in the air quality assessment which is contained within Chapter 7.0. It concludes that the proposals would not have the potential to give rise to any significant environmental effects. In light of the above, it is not considered that the proposed development would be contrary to the provisions of this policy.
N6	Indicates that the environmental impact of all proposals will be considered and that the Council will request an Environmental Impact Assessment or Appropriate Assessment be undertaken in support of a planning application.	✓			This document is the Environmental Statement which reports the outcome of the EIA carried out in support of the planning application for the proposed ATT plant. It was not considered by Scottish Natural Heritage that it would be necessary to carry out an appropriate assessment in connection with consented waste facility. Given the results of the assessment work carried out in support of the proposed ATT plant development and specifically the air quality assessment, it is not considered that it should be necessary to carry out an appropriate assessment in this instance.
N7	Indicates that where development is approved which would damage the nature conservation value of	✓			See response to Policy N5 of the SBC Structure Plan above.

Policy No.	Policy Thrust	Development helps policy	Development is neutral to policy	Development hinders policy	Comments
	a site or feature, the Council will seek to ensure that such damage is kept to a minimum.				
N8	Seeks to protect and enhance the heritage, landscape, amenity, nature conservation, and fisheries interests of the River Tweed.	✓			The proposed development would not give rise to any significant direct or indirect effects upon the River Tweed and as such would not be contrary to the provision of Policy N8.
N9	Requires that proposals that would result in a change in land use are guided by the Scottish Borders Landscape Assessment.	✓			A comprehensive landscape and visual assessment has been undertaken in support of this planning application. The full assessment is contained within Chapter 5.0. The assessment confirms that: *"The proposed development would be introduced into a context where a similar facility in the same location already benefits from planning consent. The sole appreciable difference between the proposed and consented development in landscape and visual terms would be the introduction of the proposed exhaust. This limited change would not give rise to significant adverse effects upon the landscape or upon views."*
N15	Indicates that development proposals which will adversely affect an archaeological site of regional or local significance will only be permitted if it can be demonstrated that the benefits of the proposal will clearly outweigh the archaeological value.	✓			A comprehensive archaeological assessment was undertaken in support of the planning application prepared in relation to the consented waste facility. This indicated that despite the site being the subject of significant disturbance associated with quarrying operations since 1965, archaeological remains may still exist in pockets within the development area. The importance of this being that early quarry operations at the site uncovered a roman / late Iron Age Structure and there is therefore potential within the site to encounter further archaeological remains. The issue of archaeology was discussed as part of the Council's EIA Screening Opinion which confirmed that no further archaeological work was needed but that the results of the cultural heritage chapter prepared in support of the previous planning application should be referenced (see Section 2.0 of this ES for further reference). The Council's archaeologist indicated that the most appropriate form of mitigation in this regard would be though an archaeological watching brief, which could be secured through a condition on any future planning permission.

Policy No.	Policy Thrust	Development helps policy	Development is neutral to policy	Development hinders policy	Comments
					The approach suggested by the Council's archaeologist would be acceptable to NES. It is considered that if the strategy and mitigation referenced above is followed, the proposals would be in compliance with the requirements of Policy N15.
N16	Sets out the requirements for development on site where there is reasonable evidence of the existence of archaeological remains, but their nature and extent are unknown.	✓			See response to Policy N15 of the Scottish Borders Consolidated Structure Plan above.
N20	Sets out a number of criteria aimed at achieving high quality layout, design and materials in all new developments.	✓			It is considered that the proposed development would accord with a number of the design criteria set out within the wording of the policy, the justification of this is provided below: • The proposals would be supported by a comprehensive landscape scheme, part of which (screen planting to the south) has already been implemented. • The use of appropriate and recycled building materials would be considered where feasible; • The facility would clearly be energy efficient; • The design of the facility would match that which already benefits from planning permission on the site and which has been found acceptable in this location in the past. In light of the above, it is considered, as set out in the policy wording, that favourable consideration should be given to the design of the facility.
I13	Seeks to ensure that water quality is protected from the adverse effects of development.	✓			The proposed ATT plant would be developed on the same development platform as the consented waste facility and would adopt the same measures for the management of foul and surface water discharge. These have already been assessed as being acceptable in connection with the consented waste facility development.
I14	Seek to control pollution associated with surface water discharge as part of any development proposal and encourages the use of stainable Urban Drainage Systems.	✓			As set out within the scheme description in Chapter 3.0, the ATT plant development can be accommodated on the same development platform as the consented waste facility. They will therefore not increase the overall area of hard surfacing and would therefore adopt the same sustainable urban drainage principals as the consented waste facility development. This has already been found to be acceptable to both SBC and SEPA.

Policy No.	Policy Thrust	Development helps policy	Development is neutral to policy	Development hinders policy	Comments
					In light of the above the proposals would accord with the provisions of Policy I14.
I18	Encourages the redevelopment of contaminated sites in accordance with Part IIA of the Environmental Protection Act 1990.	✓			A ground contamination assessment and associated remediation strategy were submitted pursuant to the discharge of Condition 11 attached to the planning permission for the consented waste facility. As the ATT plant would be developed in accordance with the requirement of the agreed strategy, the proposals would accord with the provisions of Policy I18.
Scottish Borders Council Consolidated Local Plan 2011					
G8	Requires that development be restricted to within Development Boundaries and sets out the exceptional circumstances where development outside the development boundaries identified on the Local Plan Proposal Map can be deemed acceptable.		✓		The principal of a built waste management development on the site and thus, outside of the development boundaries for Galashiels was first accepted with the grant of outline planning permission for a waste recovery and composting site in 2002. It has subsequently been reaffirmed through the renewal of the outline planning consent in 2007 and the subsequent planning permission for the consented waste facility in April 2011. In addition to the above, it should also be recognised that the proposed ATT plant would be developed entirely within the footprint of the site which benefits from the extant planning permission for a waste treatment plant. In light of the above, it is not considered that the proposals would be in breach of this policy.
Inf7	Sets out a series of criteria against which proposals for new waste management facilities should be assessed.	✓			It is considered that the proposed development would comply with the relevant criteria set out within the wording of Policy Inf7. The reasons for this are provided below. Firstly, the development would be: located within the primary development hub; well located in respect of the primary road network; and, on a brownfield (former quarry / landfill) site that benefits from an implemented planning permission for the development of a large waste treatment facility. Thus, it accords with the in principal requirements for the Council to support the development of a waste management facility. Secondly, it is not considered (for the reasons set out within this ES and associated appendices, that the proposed ATT plant development would give rise to unacceptable / significant effects on:

Policy No.	Policy Thrust	Development helps policy	Development is neutral to policy	Development hinders policy	Comments
					• Local amenity through noise, odour and traffic generation. Indeed, it would be preferential to the existing consented development in respect of both odour and traffic generation; • the environment, biodiversity, landscape and archaeological resources (subject to the implementation of relevant mitigation measures (e.g. an archaeological watching brief); Finally, all of the relevant supporting information listed within the wording of the planning condition associated with the consented waste facility has been provided as part of this planning application.
D4	Sets out the circumstances where renewable energy development will be supported by the Council.	✓			Whilst it is clear from all relevant national policy and guidance that the proposed ATT plant development would generate renewable energy, the policy wording specifically states that it does not deal with energy from waste developments and that consideration of any such development should be in the context of Policy Inf7. See response to Policy Inf7 of the Consolidated Local Plan above.
G1	The policy wording sets out a number of criteria / design standards which (where relevant) should be achieved in new development.	✓			It is considered that the proposals would accord with the relevant criteria set out within the wording of the policy, the justification for this is provided below. 1. The landscape and visual assessment has confirmed that the proposed development would not be out of character in the surrounding area. This is particularly the case when the proposal is compared with the built development it is proposed to replace and which could come forward on the site without further recourse to the planning system. 2. The proposal can readily be accommodated within the site and on the same development platform as the buildings they would replace. 3. The proposal would not result in the loss of any important habitats and would be supported by a landscape strategy and other necessary mitigation measures. 4. N/A 5. The proposal would include energy efficiency measures where possible and would clearly utilise renewable energy the plant being virtually 100% self-sufficient in terms of its energy supply. 6. A landscape strategy was agreed for the existing waste treatment development. This is also considered appropriate for the proposed ATT plant.

Policy No.	Policy Thrust	Development helps policy	Development is neutral to policy	Development hinders policy	Comments
					7. N/A 8. See reference to the landscape strategy above. 9. N/A 10. The surface water drainage infrastructure for the proposed ATT plant would be developed in accordance with the principals of sustainable urban drainage and be connected to and based upon the same design / concept as that proposed for the consented waste facility. 11. The proposal would demonstrably provide for sustainable waste management; 12. The overall massing of the buildings would be very similar to those which already benefit from planning permission. The only element of the scheme that would be appreciably different is the exhaust associated with the gas engines / gasifier. The impact of this upon the surrounding area has been assessed in the landscape and visual assessment contained within Chapter 5.0 of this ES. This confirms that proposed exhaust would not give rise to any significant effects upon the surrounding area. 13. As the development would be well designed and also designed in the same manner the existing waste treatment plant which was found acceptable on the site. 14. Where necessary appropriate disabled access would be provided within the development. 15. Adequate security measures including appropriate fencing and gating would be provided at the site.
G2	Sets out a series of criteria for developers to adhere to when proposing a development that is on contaminated land.	✓			See response to Policy I18 of the Consolidated Scottish Borders Structure Plan above.
BE2	Indicates that when development proposals impact on a Scheduled Ancient Monument, other nationally important sites not yet scheduled or any other archaeological or historical site, developers will be required to carry out detailed investigations to ensure compliance with Structure Plan policies N14, N15 and N16.	✓			See response to Policy N15 of the Consolidated Scottish Borders Structure Plan above.
NE1	Indicates that sites of	✓			See response to Policy N2 of the Consolidated

Policy No.	Policy Thrust	Development helps policy	Development is neutral to policy	Development hinders policy	Comments
	international importance for nature conservation will be afforded the highest level of protection from development and that development proposals which impact upon an internationally important wildlife site must comply with Structure Plan Policy N2.				Scottish Borders Structure Plan above.
NE2	Indicates that where development proposals impact on a national nature conservation sites, developers will be required to submit sufficient information about the impact of the development on the features of interest of the site to ensure compliance with Structure Plan Policy N3.	✓			See response to Policy N2 of the Consolidated Scottish Borders Structure Plan above.
NE3	Sets out five criteria which seek to protect local biodiversity from new development. All development proposals are required to meet the relevant criteria.	✓			See response to Policies N2 and N5 of the Consolidated Scottish Borders Structure Plan above.
NE5	Aims to protect the quality of the water resource and requires developers to consider how their proposals might generate potentially adverse impacts and to build in measures that will minimise any such impacts and enhance and restore the water environment. Any proposals not demonstrating this will be refused.	✓			See response to Policies I14 and I15 of the Consolidated Scottish Borders Structure Plan above.
EP3	Indicates that development will only be allowed within the area defined as countryside around towns if: o There is an essential requirement for a rural location and the use is appropriate in the countryside; o It involves the rehabilitation, conversion,		✓		The principal of a built waste management development on the site and thus, outside of the development boundaries for Galashiels was first accepted with the grant of outline planning permission for a waste recovery and composting site in 2002. It has subsequently been reaffirmed through the renewal of the outline planning consent in 2007 and the subsequent planning permission for the consented waste facility in April 2011.

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	limited extension or an appropriate change of use of existing traditional buildings of character; and o It enhances the existing landscape, trees, woodland, natural and man-made heritage, access and recreational facilities; or o Subject to satisfactory design and setting, it has a proven national or strategic need and no alternative is suitable.				In addition to the above and more importantly, it should also be recognised that the proposed ATT plant would be developed entirely within the footprint of the site which benefits from the extant planning permission for a waste management facility. In light of the above, it is not considered that the proposals would be in breach of the requirements of this policy.
EP5	Seeks to prevent development proposals that, individually or cumulatively, could adversely affect the quality of air in a locality to a level that could potentially harm human health and wellbeing or the integrity of the natural environment.	✓			A comprehensive air quality assessment has been carried out in connection with the proposed ATT plant development, this confirms that: • The development would not give rise to any significant environmental effects in terms of aerial emissions and specifically in relation to oxides of nitrogen; • The proposed development would not give rise to any unacceptable / significant effects upon human health or protected ecological sites; and • There would not be any cumulative air quality effects as a result of the proposals. In light of the above, it can be concluded that the proposals would be in accordance with the requirements of Policy EP5.
Inf6	Sets out a series for criteria requiring developers to confirm that sustainable urban drainage principals have been adopted when bringing forward development proposals.	✓			See response to Policies I13 and I14 of the Consolidated Scottish Borders Structure Plan above.
National Planning Framework					
National Planning Framework for Scotland 2 (June 2009)					
Para.26	Supports the development of infrastructure to meet renewable energy targets.	✓			The proposed ATT plant development would include renewable energy generation infrastructure that would assist in meeting renewable energy targets.
Para. 27	States that additional facilities for the treatment and recycling of municipal,	✓			The proposed development would, in combination with the adjacent fuel preparation facility, provide additional facilities and

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	commercial and industrial wastes are urgently needed and that the construction and operation of waste management installations can also offer new economic opportunities.				infrastructure for the recycling and further treatment of the SBCs waste.
Para. 48	Seeks to reduce greenhouse gas emissions by making the most of Scotland's renewable energy potential and encouraging power and heat generation from clean low carbon sources.	✓			The proposed ATT plant would include renewable energy generation infrastructure that would assist in meeting renewable energy targets. In doing so, it would directly contribute to the reduction of greenhouse gas emissions. In this context, it should be noted that the RDF that would be used as a feedstock for the facility is predominantly comprised of items of biological origin (eg paper, card, cotton, wool, leather, bio-plastics, food waste, plant waste etc). Whilst it will contain some contamination of fossil origin plastic, and some inert materials such as glass, metal, and grit, the majority of its energy content will be of biological origin. As a consequence, the carbon contained within the RDF material will be of "short cycle" or atmospheric cycle origin and will be neutral in terms of its effects as a greenhouse gas, if emitted as gaseous carbon dioxide (C02). In addition to the above, the ATT plant would also indirectly further contribute to the diversion of waste from landfill with the associated reduction of methane releases to the atmosphere (noting that methane is a greenhouse gas circa 24 times more potent than CO_2).
Para. 53	Sets out the main elements of the Plan's spatial strategy to 2030 many of which are of relevance to the ATT plant development.	✓			The proposed ATT plant would meet the main elements of the spatial strategy by virtue of: • It contribution to combating climate change; • The generation of renewable low carbon heat and power; and • It's contribution to the achievement of sustainable waste management targets.
Para 103	Identifies that the competitiveness of places depends upon investment in infrastructure. It also indicates that new installations are needed for the more effective management and recycling of waste and advocates the development of local heat distribution networks that improve energy and resource efficiency.	✓			The proposed development would represent a significant financial investment in infrastructure that would result in more effective management of waste. It would also provide renewable electricity and could contribute renewable heat to a local district heating network.

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	Encourages the development of local heat distribution networks.				
Para. 144	Sets a target of generating 50% of electricity from renewable sources by 2020, working towards deriving 20% of total energy use from renewable sources by 2020.	✓			The proposed ATT plant would clearly contribute towards the achievement of these targets through the production of renewable energy (electricity and heat).
Para. 164	Confirms the Governments desire to decentralise energy generation and develop local heat networks.	✓			The proposed ATT plant would represent a decentralised energy generation facility. It would also provide renewable electricity and could potentially contribute renewable heat to the planned Langlee district heating system (see the Heat Plan in Part 3 of the Planning Application Document for further details).
Paras. 166-168	Identifies that the development of necessary waste management infrastructure is a Government priority to ensure the diversion of waste from landfill. It notes that the planning system has a crucial role to play in ensuring that installations are delivered in time to allow waste management targets to be met.	✓			The proposed ATT plant development (and the adjacent fuel preparation facility) would represent significant investment in waste management infrastructure that would directly contribute to the diversion of waste from landfill and the achievement of national waste management targets.
Paras. 166 - 168	Sets out key elements and targets of the Scottish Government's waste strategy and encourages planning authorities to facilitate a provision of a network of waste management installations.	✓			The proposal would form part of a network of waste management facilities (including the adjacent fuel preparation facility) that would complement existing waste collection and recycling infrastructure in the SBC's administrative area. Through the combustion of the syngas (derived from RDF) electricity and heat would be generated.
Para. 169	Defines modern waste treatment and transfer centres as contained facilities which can be accommodated on industrial estates, preferably close to the population centres they serve and in close proximity to the sources of waste and the transport network.		✓		Whilst the proposed development is not within an established industrial estate, it is being proposed on a site that already benefits from a permanent (and implemented) planning permission for the development of a waste treatment facility. In addition, it is within the boundary of an operational landfill site and adjacent / co-located with other waste management development. The ATT plant is intended to complement the consented waste facility and ensure that residual municipal waste arising within the SBC administrative area is managed further up the waste hierarchy. The site is located centrally

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					within this area, proximate to one of the main sources of residual waste arisings, adjacent to other key waste management infrastructure and served by good access to the primary road network. In light of the above, it is not considered that the proposals would be in breach of this part of the NPF for Scotland.
Scottish Planning Policy (February 2010)					
Para. 37	Indicates that the planning system plays an important role in supporting sustainable development and sets several sustainability objectives that decision making in the planning system should seek to achieve.	✓			The proposed ATT plant would: • contribute to the reduction of greenhouse gas emissions and the development of renewable energy generation infrastructure (as described above); • support the achievement of Zero Waste objectives, including the provision of the required waste management installations (see assessment of the Zero Waste Plan below); • protect and enhance the cultural heritage (refer to Chapter 2.0 of this ES for further details); • protect and enhance the natural environment, including biodiversity and the landscape (refer to Chapters 2.0 and 5.0 of this ES for further details); • take into account the implications of development for water, air and soil quality (refer to Chapter 2.0 of this ES for further details).
Paras. 182 and 184	Sets out the Scottish Government's commitment to increasing electricity generation from renewable sources. Including the target of 50% of Scotland's electricity to be generated from renewable sources by 2020 and 11% of heat demand to be met from renewable sources. It also states that these targets should not be seen as a cap. Also supports the development of a diverse range of renewable technologies.	✓			The proposed ATT plant would provide renewable electricity and could contribute renewable heat to the planned Langlee local district heating network and in doing so, would contribute to the achievement of the relevant targets.
Para. 195	Indicates that Industrial sites with the potential for connection to the electricity grid or other possible users are likely to be suitable	✓			See response to Policy G8 of the SBC Consolidated Local Plan 2011

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	locations for energy from waste plants. It also indicates that the location of facilities will also be influenced by the source of the waste used.				
Para. 212	Reiterates the Government's targets from the Zero Waste Plan such as achieving the 70% recycling target by 2025. Promotes the recovery of value from used products through recycling, composting or energy recovery, via a 'significant increase in waste management infrastructure. Stipulates that a significant commitment to enabling the development of new waste management infrastructure through the planning system is required.	✓			Refer to assessment of the policy and guidance set out within the Zero Waste Plan below.
Para. 213	Requires waste to be dealt with in accordance with the waste hierarchy and the proximity principle (i.e. as close as possible to where it is produced).	✓			The proposed ATT plant would demonstrably move the management of residual waste up the waste management hierarchy and as stated previously, would also be consistent with the proximity principle.
Para. 214	Seeks a significant increase in the number, range and type of waste management facilities required to manage municipal, commercial and industrial waste management installations. It indicates that a number of types of waste management installations are required including materials recycling facilities, thermal treatment plants and anaerobic digestion facilities.	✓			The proposed ATT plant would contribute to delivering the required facilities and in particular thermal treatment facilities.
Para. 219	Indicates that in considering the location of thermal treatment facilities the sensitivity of surrounding land uses should be taken into account. It also notes that thermal treatment technology is more beneficial if it delivers both	✓			The principles / requirements set out within paragraph 219 of the Plan have been taken into consideration in determining the location of the proposed development. As demonstrated in this ES and the associated environmental assessments, the proposal would not give rise to any significant environmental effects upon sensitive land uses in the locality. Moreover, the proposal also

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	heat and power. The siting of plant close to energy grids or users of heat is an important factor in determining appropriate locations for installations capable of being run as combined heat and power (CHP) plants.				have the potential to deliver a combined heat and power solution in a location that is well suited to such a development (it is near to a grid connection) and has the potential to form part of the proposed Langlee district heating network.
Emerging Development Plan					
Strategic Development Plan for Edinburgh and South East Scotland (SESplan) - Proposed Plan					
1A	Identifies a series of Strategic Development Areas within which further development is to be directed / focussed.	✓			The ATT plant would be located within one of the core areas the Plan requires development to be directed.
1B	Sets out a series of core development principles councils are to take into account when formulating their LDP's.	✓			It is considered that the proposed ATT plant would accord with the provisions of emerging Policy 1B for the following reasons: • as demonstrated in this ES, the proposed development would not give rise to any significant effects upon the integrity of international, national and local designations, including all of those listed within the policy wording; • the development would not give rise to any significant adverse impacts upon the integrity of international and national built or cultural heritage sites; • The proposal would not impact upon the natural or built environment but would be supported by a landscape strategy that would provide landscape improvements locally. In addition, the facility would also contribute towards the quality of life in the local community through the provision of renewable energy and heat to the proposed Langlee district heating system. The facility would demonstrably contribute to the national and international response to climate change • Regard has been given to high quality design and the use of materials. Indeed, the design of the facility has been based upon the same principles as the consented waste facility. In addition, the facility would also clearly be energy efficient with virtually 100% of the ATT plants energy requirements coming from its operation.

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11	Sets out the areas and circumstances where sustainable energy developments would be deemed acceptable.	✓			The ATT plant would comprise a renewable energy development that would offer significant socio-economic benefits without giving rise to any significant effects upon the environment, local amenity or the local transport network. Indeed, with regard to the latter, it would actually result in benefits in terms of reducing the traffic that would have been generated by the consented waste facility on the site. In light of the above, it is considered that the proposals would be in full accordance with the requirements of draft Policy 11.
14	Sets out a series of criteria which should be taken into consideration by councils in developing policies within their LDP relating to waste management.	✓			It is considered that the proposed development would fully accord with the relevant criteria set out within the policy wording, for the following reasons: a) As set out elsewhere within this planning policy appraisal the proposed development would be in full accordance with the relevant provisions of the zero waste plan. b) N/A c) The development is being proposed on one of the sites that are identified as a safeguarded waste management site within the policy wording.
European and National Waste Management Policy, Legislation and Guidance					
Revised Waste Framework Directive 2008/98/EC (December 2008)					
Para 20.	Clarifies where the incineration of municipal waste can be defined as a recovery operation by reference to Annex II Point R1. A footnote to the R1 definition states that: *"this includes incineration facilities dedicated to the processing of municipal waste only where their energy efficiency is equal to or above 0.65%*", and defines energy efficiency using a formula which takes into account the differing benefits of electricity generation and heat generation.	✓			SEPA's position with respect to defining 'high level of efficiency' to meet the statutory requirement within the Directive is: *i) for plants with an incineration capacity equal to or less than 300,000 tonnes per annum compliance with the targets specified in Annex 1 to the Guideline including both the start-up and longer term heat and power plan provisions; or* *ii) for plants with an incineration capacity greater than 300,000 tonnes per annum, compliance with the targets specified in Annex 1 to the Guidelines including both the start-up and longer term heat and power plan provisions and that the plant is, on start-up, a recovery operation as defined by the EU Directive on Waste (2008/98/EC) R1 formula criterion of 0.65.* As the proposed ATT plant has a throughput of less than 300,000tpa and as such, it is not necessary to apply the R1 formula at start up.

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					Compliance with the other provisions is provided in the Heat and Power plan contained within Part 3 of the PAD.
Article 4	Seeks to move the management of waste up the waste hierarchy and reduce reliance upon landfill.	✓			The ATT plant facility is considered to comply with Article 4 by moving the management of residual waste up the waste hierarchy and thus reducing the reliance upon landfill.
Article 13	Sets out a range of environmental factors waste recovery operations should not adversely impact upon.	✓			In respect of Article 13, it is considered that the assessments undertaken in support of this planning application demonstrate that: • Subject to appropriate mitigation measures being implemented, there will be no significant risk to water, air, soil, plants or animals; • There will be no significant nuisance through noise and/or odours; and • There will not be a significant adverse effect on the countryside or places of special interest.
Article 16 Para 1	Requires member states to establish an integrated and adequate network of waste facilities for the recovery of waste.	✓			As set out previously in this assessment table the proposed ATT plant would form part of an integrated solution for the management of the SBCs residual municipal waste.
Article 16 Para 3	Paragraph 3 requires a network which enables waste to be disposed of, or recovered, in one of the nearest appropriate installations, by means of the most appropriate methods and technologies.	✓			The facility is located centrally within the Council's administrative area, proximate to one of the greatest sources of waste arisings, adjacent to the current final disposal location for residual municipal waste and served by good access to the primary road network. With regard to technology, as set out previously the current concept for the consented waste facility at Easter Langlee envisaged the export of RDF and compost like output to third parties some distance from the proposed site. The proposed ATT plan would: • provide treatment of residual municipal waste. • divert waste presently being sent to landfill. • allow for the generation of renewable energy (electricity and heat), the former of which would be exported to the local distribution network and the latter, potentially, to the planned Langlee district heating network. • potentially allow for residues for the process to be disposed of directly to the adjacent council owned landfill site. • on account of the points raised above, fulfil a greater sustainable waste management role than the existing, consented, water treatment facility.

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					In light of the above, it is considered that the proposal would be in the right location and utilise the most appropriate methods and technology to meet the residual waste management needs of SBC.
Planning Advice Note 63: Waste Management Planning (February 2002)					
Para. 16	Indicates that a BPEO appraisal by planning authorities or operators of land use planning options may be helpful.		✓		The concept of BPEO no longer forms part of the waste planning policy context, failing to appear in the relevant contemporary planning framework documents.
Paras. 22 - 50	Sets the key criteria for assessing a suitable location for waste management facilities with varying technologies.	✓			The proposed ATT plant would accord with the criteria by virtue of: • It not resulting in any material effects on the population or environment; • According with the relevant principals of sustainable waste management; • It being located on part of an existing consented and implemented waste treatment site; • Being an energy from waste solution with CHP.
Par. 53	Seeks a 'presumption in favour of proposals for waste management development that are consistent with the development plan'.	✓			As demonstrated by this planning appraisal the proposal accords with the policies of the statutory development plan.
Para. 57	States that if an AWP (Area Waste Plan) is not yet available for the area, or if the proposal relates to a waste stream not covered by the AWP, the NWS (National Waste Strategy) is a material consideration.	✓			The AWP is superseded by both the NWS, which itself is largely superseded by the Zero Waste Plan. As such, please refer to the Zero Waste Plan assessment below.
Paras 62 -67	Outlines the potential environmental consequences and mitigating procedures associated with waste management development.	✓			The proposal has been developed cognisant of the potential environmental effects and incorporates the appropriate mitigation measures to ensure that there are no significant effects would occur during either its construction or operation.
Paras 74 - 79	Outline the transport needs, consequences and mitigating procedures associated with waste management development.	✓			With regard to transport, it should be noted that the ATT plant is a facility that is designed (in conjunction with other waste management infrastructure) to meet the needs of the Scottish Borders. Within this area all waste collection is by way of road transport and no infrastructure exists for non-road based movement of waste. Consequently, the only

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					practical and viable option for transportation is by road. In this regard, it is noteworthy that the site is located centrally within this region, proximate to the greatest source of waste arisings and served by good access to the primary road network. In addition to the above, it should also be noted that all of the material handled at the ATT plant would previously have been processed at the consented waste facility. Thus there will be no additional traffic movements associated with delivery of waste. Moreover, as the concept for the waste plant envisaged the export of RDF and CLO to third parties located at distance from Easter Langlee, there will in fact be a reduction in traffic movements as a consequence of the wider project.
Paras 80-83	Outlines the design expectations associated with waste management development.	✓			See response to Policy N20 of the Scottish Borders Council Consolidated Structure Plan 2009.
Annex	Sets out the principles of sustainable waste management and indicates that all decisions on future waste management should be based upon the following principles: • Sustainability; • Self-sufficiency and the proximity principle; • The waste hierarchy; and • The BPEO.	✓			The ATT plant would demonstrably contribute to the principals of sustainable waste management set out within the annex to PAN 63: • Sustainability - by virtue of: o It not resulting in an material effects on the population or environment; o It according with the relevant principals of sustainable waste management; o It being a renewable energy solution with CHP. • Self-sufficiency – by meeting the demonstrable need for new infrastructure in the Scottish Borders. • Proximity Principle - the site is located centrally within the Scottish Borders administrative area, proximate to the greatest source of waste arisings and served by good access to the primary road network; • The waste hierarchy – the facility would demonstrably move the management of residual waste which up the waste management hierarchy; • BPEO – as discussed previously BPEO is no longer a planning determinant in Scottish waste planning policy.
Scotland's Zero Waste Plan (June 2010)					
Action 2	Sets a long term target of 70% recycling for all waste	✓			The ATT Plant would demonstrably contribute to the achievement of this target.

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	arising in Scotland by 2025, regardless of its source.				
Action 10	The Scottish Government in partnership with others will implement the forthcoming Low Carbon Economic Strategy which supports investment in innovative resource management technologies and the utilisation of renewable energy generated from resource management technologies.	✓			As noted previously the ATT plant would represent considerable investment in innovative resource management technologies capable of generating renewable energy (electricity and heat).
Action 14	Introduction of regulatory measures to support the delivery of landfill bans, by ensuring energy from waste treatment is only used to recover value from resources that cannot offer greater environmental and economic benefits through reuse or recycling.	✓			The ATT plant has been specifically designed to divert waste from landfill as part of an integrated process, in combination with an adjacent waste fuel preparation facility. The adjacent fuel preparation facility would be specifically designed to recover recyclable material from residual waste and produce a RDF product. This would be used in the ATT plant to produce as syngas and ultimately to generate renewable energy. The RDF would comprise a resource from which all practical and economically viable efforts have been made to recover recyclables.
Annex A	Sets out a series of waste management targets.	✓			The ATT plant would contribute to the achievement of the stipulated targets.
Annex B	Indicates that subject to detailed site specific considerations, waste management facilities can be considered appropriate for sites allocated in development plans for employment and industrial use.	✓			See response to policy G8 of the SBC Consolidated Local Plan.
Annex B	Sets out a series of locational criteria to be used by planning authorities and developers when identifying and assessing sites for waste management.	✓			The ATT plant would be consistent with the relevant locational criteria: • Whilst not located on an industrial site the development is proposed on a site which benefits from a permanent and implemented planning permission (see response to Policy G8 of the Consolidated Scottish Borders Local Plan for a more detailed justification); • It is well located in terms of the strategic road network and noting that as described previously non-road based transportation is not considered practicable or viable; • It having no significant impacts on the

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					environment; and • Comprising a CHP solution.
SEPA's Thermal Treatment of Waste Guidelines 2009 (with May 2011 update)					
	Outlines SEPA's thermal treatment of waste (including Anaerobic Digestion plants) guidelines and stipulates that these should be used by planning authorities in developing policies, allocating sites and assessing development proposals. This includes the requirement for energy from waste plants to be highly efficient and be the subject of a Heat Plan, amongst other things, at the Permitting stage.	✓			The applicant will be submitting a Permit Application during the determination of the planning application. In addition, the core requirement to provide a Heat and Power Plan has been included in Part 3 of the Planning Application Document. This demonstrates that the proposed ATT plant would be an efficient generation facility and could export both power and heat.
Scotland's Zero Waste Regulations, Policy Statement (October 2011)					
Section 1.3	Seeks to support the zero waste policy by maximising the quantity and quality of material available for recycling and minimising the need for residual waste treatment and moving residual waste management up the waste hierarchy.	✓			The ATT plant has been specifically designed to divert waste from landfill as part of an integrated process, in combination with an adjacent fuel preparation facility. The adjacent fuel preparation facility would recover recyclable material from residual waste and produce an RDF product. This would be used in the ATT plant to generate a syngas which would be combusted to produce renewable low carbon energy. The RDF would comprise a resource from which all practical and economically viable efforts have been made to recover recyclables. Ash produced from the ATT plant will, where feasible be recovered as a secondary aggregate.
Section 3.1	Supports the management of waste at a higher tier within the waste hierarchy by ensuring that materials achieve their optimum re-use so that value is not lost.	✓			The ATT plant and associated, adjacent, fuel preparation facility would (in combination) move the management of the SBC's residual waste up the waste hierarchy and in doing so, ensure that all practical, economic efforts would be undertaken to recycle material to ensure that their value is not lost.
Section 6.1	Whilst seeking to reduce the volume of martials requiring residual waste treatment the guidelines are implicit that there will remain a need for	✓			The proposed ATT plant would minimise the quantities of residual waste that would require further treatment.

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	such facilities.				
Section 6.2	Proposes (from 2015) the introduction of measures to ensure the removal of marketable recyclables from residual municipal waste prior to thermal treatment.	✓			See response to Section 1.3 above.
Section 6.4	Indicates that the proposed ban on the disposal of biodegradable waste material to landfill (due in 2020) will direct unsorted waste to pre-treatment facilities to enable further extraction of resource value.	✓			The ATT plant would ensure that further value (in the form of renewable energy) to be generated from the RDF (material which cannot be further recycled / recovered).
Waste (Scotland) Regulations 2012					
The provisions contained within the Waste Scotland Regulations are largely the same as those identified within the Zero Waste Regulations Policy Statement (above). As a consequence, the proposals have not been assessed against their provisions again here.					
SEPA Guidance Note 6 Land Use Planning System (March 2012)					
Para. 2.2	Reinforces the role of the waste hierarchy and recognises that the move towards sustainable waste management will necessitate the development of more facilities to sort, reduce, recycle, recover value (including energy) from waste.	✓			The proposed ATT plant would (as stated previously in this assessment table) demonstrably contribute to the move towards sustainable waste management and move the management of residual waste up the waste hierarchy.
Para. 4.3	With regard to the assessment of applications for new waste management facilities by SEPA the guidance note indicates that the issues which should be considered are, the waste hierarchy, proximity principle, need, site selection and contestability, the use of waste as a resource and compliance with the thermal treatment of waste guidelines.	✓			The proposed ATT plant would accord with the key considerations for the following reasons: • Waste hierarchy - refer to previous responses above • Proximity principle - refer to previous responses above • Need – there is a clear need for the facility in terms of both the management of residual municipal waste, its diversion from landfill and in the generation of renewable energy • Site selection and consentability – as stated previous, the proposals are wholly within a site that benefits from an implemented planning permission for a waste management facility. The development would replace buildings and infrastructure associated with the existing development • Waste as a resource - refer to previous

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					responses above. • Compliance with TTWG - refer to previous responses above.
Paras11.1 & 11.2	Refers to the Thermal Treatment of Waste Guidelines 2009 as a material planning consideration. With regard to heat reference is given to the siting of plant close to existing heat users where feasible. With regard to SEPA's consideration, Thermal Treatment facilities key information relates to site selection; restrictions on inputs and recovery of heat and energy.	✓			As set out previously within this ES the facility could provide heat to the planned Easter Langlee district heating network as well as electricity to the local network. In this regard reference should also be made to the Heat Plan contained within Part 3 of the PAD.
European and National Energy / Renewable Energy Policy, Legislation and Guidance					
Energy White Paper: Meeting the Energy Challenge (May 2007)					
	National strategy in respect of future energy development.	✓			The White Paper indicates that Local Planning Authorities should look favourably upon renewable energy developments.
UK Renewable Energy Strategy (July 2009)					
	Sets out a range of measures aimed at the achievement of the UK share of the EU renewable energy target.	✓			The Renewable Energy Strategy recognises that the production of energy from the biodegradable fraction of waste has an important role to play in the overall achievement of the UK's renewable energy targets. The proposed ATT plant development would generate renewable energy and heat and in doing so contribute towards the achievement of the UK's renewable energy targets.
UK Low Carbon Transition Plan (July 2009)					
	Sets out the plan for transforming a number of sectors including the power and waste sectors to meet carbon budgets.	✓			It is considered that the ATT plant would accord with the relevant provisions of the plan. For the following reasons: • The facility would demonstrably contribute towards the target of obtaining 40% of electricity from low carbon sources; • The facility would contribute new investment in low carbon infrastructure; • The facility would contribute towards

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					security of electrical supply; • The facility would support the rapid development of low carbon technologies as stipulated in Chapter Three of the Plan; • In accordance with Chapter Seven of the Plan, the facility would contribute towards reduced emissions when compared to the landfilling of waste and reductions in the amount of waste that is landfilled. Moreover, the facility would also encourage greater production of bio-energy from combustion.
Renewable Heat Incentive (March 2011)					
	Supports the EU Renewable Energy Directive (2009) in meeting the binding target of 20% of the EUs energy consumption coming from renewable sources. The report provides the UK Government's perspective with regard to proposed technologies for the production of renewable heat. This includes energy from waste combustion and biogas combustion.	✓			The ATT plant would demonstrably support the provisions of the Renewable Heat Incentive through the potential heat off-take opportunities in connection with the proposed Langlee district heating network.
UK Renewable Energy Roadmap (July 2011)					
	Roadmap sets out a comprehensive action plan to accelerate the UK's deployment and use of renewable energy in order to achieve its 2020 EU targets. It identifies the eight technologies that have either the greatest potential to help the UK meet its targets in a cost effective or sustainable manner or offer the greatest potential for the decades to follow. Two of these are electricity and heat generated from biomass.	✓			The ATT plant would generate electricity and heat from waste biomass.
The UK Carbon Plan: Delivering our Low Carbon Future (December 2011)					
	Contains a section specifically relating to waste	✓			The ATT plant would, as stated in more detail previously, demonstrably move the

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	and resource efficiency which seeks to move waste management up the waste hierarchy and to ensure that waste recovery is energy efficient.				management of residual waste up the waste hierarchy and recover energy from waste in a highly efficient manner.
Biomass Action Plan for Scotland (2007)					
Para 1.2	Recognises the huge potential to develop the market share of biomass and its contribution to the Scottish Climate Change Programme.	✓			The facility would recover renewable energy from the biomass fraction of waste and, in doing so, contribute to combating climate change.
Para 1.8	It identifies that the waste sector is an important element of biomass supply citing thermal treatment facilities as potential technologies.	✓			The ATT plant would recover renewable energy from the biomass fraction of waste.
Para 4.12 and Para 9.5	Confirms that the thermal treatment of biomass would be environmentally preferable to disposal at landfill in accordance with the waste hierarchy.	✓			The ATT plant would recover renewable energy from the biomass fraction of waste it thermally treats and obviate the need for its disposal at landfill.
Climate Change (Scotland) Act 2009					
	The Act contains targets for at least 50% of electricity and 11% of heat to be generated by renewable sources by 2020. These targets are also contained in Paragraph 182 of the consolidated Scottish Planning Policy.	✓			The ATT plant has the potential to contribute towards the achievement of both targets.
The Climate Change Delivery Plan: Meeting Scotland's Statutory Climate Change Targets					
Para 2.2 & 2.3	If 2050 targets are to be met indicates a requirement for a largely decarbonised electricity sector by 2030 and a largely decarbonised heat sector by 2050.	✓			The ATT plant would provide low carbon heat and power.
Para 3.12	Seeks an increase in renewable sources of electricity by 2030 at all	✓			The ATT plant would increase renewable energy production.

Policy No.	Policy Thrust	Development helps policy	Development is neutral to policy	Development hinders policy	Comments
	scales.				
Ch 4	Indicates a requirement for a massive increase in the use of renewable or low carbon heating and a step change in the level of renewable and low carbon heat by 2020 and promotes the use of waste heat and other forms of combined heat and power.	✓			The ATT plant would provide renewable / low carbon heat and power.
Paras 7.4 & 7.5	Supports the diversion of waste from landfill in meeting climate change targets.	✓			The ATT plant in conjunction with the adjacent (consented and implemented) waste treatment plant would divert waste from landfill and thus contribute in meeting climate change targets.
Renewables Action Plan (June 2009)					
	Reiterates the targets set out in other documents for at least 50% of electricity and 11% of heat to be generated by renewable sources by 2020. And sets out the renewable objectives for Scotland. The plan also includes (In Annex A) sectoral routemaps for renewable heat and renewable energy from biomass.	✓			The ATT plant would contribute to towards the achievement of both targets.
Renewable Heat Action Plan for Scotland (November 2009)					
	Focuses on the actions required over the next two years to accelerate progress towards the Scottish Government's target of 11% of the heat consumed in 2020 to come from renewable sources. This includes the generation of heat from EfW facilities and its use in CHP and district heating schemes. The Plan notes that if 25% of 'suitable' wastes are thermally treated this could provide just below 5% of Scotland's heating needs.	✓			The ATT plant would contribute to towards the achievement of the targets. It would contribute to a planned local district heating scheme and the capture of energy and heat from the plant would be undertaken in the most efficient manner. Thus, the proposals would accord with the relevant provisions of the Heat Action Plan.

Policy No.	Policy Thrust	Development helps policy	Development is neutral to policy	Development hinders policy	Comments
	The bioenergy based actions set out within the Plan seek to promote opportunities in the energy from waste sector, including the encouragement of local district heating schemes and opportunities in C&I waste. It also seeks to ensure that energy from waste plants capture heat efficiently and explore markets for the heat.				
Energy from Waste Potential in Scotland (January 2010)					
The publication does not add materially to the planning framework. Like many of the previously referenced policy documents, identify that energy from waste will play an important role as being part of the county's low carbon energy generation infrastructure mix, particularly in terms of meeting Scotland's renewable heat target (i.e. 11% of heat to be generated by renewable sources by 2020).					
Draft Electricity Generation Policy Statement (March 2012)					
	Provides a clear view on the need for rapid expansion of renewable electricity across Scotland by delivering the equivalent of at least 100% of gross electricity consumption from renewables by 2020 as part of a wider, balanced electricity mix, with thermal generation playing an important role though a minimum of 2.5 GW of thermal generation. The policy statement refers to the unique and essential role of biomass in providing renewable electricity and heat. The plan also (at Paragraph 55 - 56) specifically identifies the important contribution and energy from waste facilities will have in respect of renewable energy and climate change targets. Like the renewable heat action plan for Scotland the	✓			The ATT plant development would contribute to the rapid expansion of renewable energy that is needed to meet the revised renewable energy generation target. Consideration has been given to the use of heat from the facility and a local distribution network has been identified for the use of heat.

Policy No.	Policy Thrust	Development helps policy	Development is neutral to policy	Development hinders policy	Comments
	plan (Paragraph 60) seeks to ensure that applications for thermal treatment facilities are accompanied by evidence of how waste heat could be used.				
Low Carbon Scotland: Meeting the Emissions Reduction Targets 2010-2022 (March 2011)					
	The plan sets out how Scotland proposes to deliver its targets for reduced emissions, including a 42% reduction of 1990 levels by 2020. In relation to the proposed development the report effectively reiterates the targets and policies of other documents including: • the draft electricity generation policy statement; • renewable heat action plan; • key EU Waste Framework Directive and Landfill directive targets; and • the Scottish Zero Waste Plan targets.	✓			The ATT plant would contribute to the diversion of waste from landfill and thus contribute in meeting climate change targets.
Planning our Electric Future: A White Paper for secure, affordable and low-carbon electricity (July 2011)					
	Provides the Government's response to the future loss of the UK's generating capacity from coal and nuclear plants over the next 10 years. It also sets out the key measures to create a secure mix of electricity sources including new renewables.	✓			The White Paper is very broad in its scope. However, it does recognise (in Box 12) the role that energy generated from waste can have in securing affordable low carbon energy. It is clear therefore that the White Paper supports developments like the proposed ATT plant.
2020 Routemap for Renewable Energy in Scotland (July 2011)					
	Sets out the measures that are proposed to meet the targets for renewable energy and heat including the generation of an equivalent of 100% of demand from renewable sources by 2020 and 11%	✓			The ATT plant would contribute to the targets for renewable energy and heat.

Policy No.	Policy Thrust	Development helps policy	Development is neutral to policy	Development hinders policy	Comments
	of renewable heat by the same date. With regard to renewable heat the plan (at section 3.4) indicates that Scotland's current renewable heat deployment is only 2.8% and this could rise to 4.5% if all planned development's come forward. This is well below the 2020 target and it is noted that progress needs to be made across all scales of installation. With regard to renewable electricity the biomass and energy from waste sectoral routemap (section 3.5) identifies the important role bioenergy and energy from waste and in particular biomass have to play in meeting renewable energy targets. The routemap indicates the energy from waste could contribute 2TWh of useful heat and 0.9TWh of electricity per year.				
Renewable Energy: The Renewables Obligation (Scotland) Order 2011 Consultation on Review of ROC Bands (October 2011)					
	It is proposed to continue to support EfW (with CHP) as renewable energy technologies.	✓			The ATT plant would contribute to the targets for renewable energy and heat.

4.3 Conclusions

4.3.1 It can be seen from the assessment of relevant development plan policy and other material planning considerations in Table 4.1 above, that the proposed ATT plant is either in conformity with, or supported by, practically all facets of the identified planning context.

4.3.2 The proposal demonstrably accords with the overall thrust of development plan policies taken as a whole. Furthermore, the material considerations that have been identified do not support the planning application being determined other than in accordance with the Development Plan. Therefore, in accordance with Sections 25 and 37(2) of the Planning (Scotland) Act (as amended by the planning etc (Scotland) act 2006) planning permission should be granted.

4.3.3 Should the Council, in determining the application, find that, in its view, there is tension with any development plan policy then this should be viewed in the context of the relevant material planning considerations set out within this assessment. In this regard the assessment has identified a wealth of material planning considerations that add very significant weight in support of the proposal (and approval of the planning application). These relate to the benefits that the proposed facility would bring in relation to contributing towards delivering sustainable waste management, combating climate change through renewable energy production and the demonstrable social / economic benefits of the scheme. Overall, it is judged that the support for the development arising from non-development plan policy, strategy and legislation is so overwhelming that it far outweighs any perceived adverse consequences of the scheme.

5.0 LANDSCAPE AND VISUAL IMPACT

5.1 Introduction

5.1.1 This chapter of the ES reports the findings of the Landscape and Visual Impact Assessment (LVIA) that has been carried out in respect of the proposed ATT plant at Easter Langlee, Galashiels.

5.1.2 The site of the proposed development benefits from planning consent (ref. 10/00165/AMC) for the development of a Mechanical and Biological Treatment (MBT) facility (referred to as the consented waste facility), which would be physically very similar to the proposed development. An LVIA was submitted by the Applicant in relation to the consented waste facility and is appended to this Chapter (see Appendix 5-1).

5.1.3 As such, this current LVIA seeks to provide updated information in relation to the potential landscape and visual effects of the proposed development. Attention is focused on those elements of the proposed ATT plant that differ from the consented waste facility and also to any change to the assessment baseline that may have occurred since the grant of planning permission for the consented waste facility in 2011.

5.1.4 The LVIA was undertaken by a Chartered Member of the Landscape Institute (CMLI). The site and the surrounding area were visited in February 2013. A draft of the LVIA was provided to SBC for comment. This final version of the LVIA reflects the pre-application advice received from the Council.

5.2 Summary of the Proposed Development

5.2.1 A full description of the proposed development is set out in Chapter 3.0 of this ES. The principal components of the development are summarised below:

- Tallest building of maximum ridge height 11.9m;
- ATT exhaust at a height of 23m; and
- Associated ancillary development.

5.2.2 The principal changes from the consented waste facility would be:

- Localised change to the proposed development footprint; and
- The presence of the ATT plant and associated exhaust.

5.2.3 The other changes between the consented waste facility and proposed ATT plant are not considered to be of any consequence to the likely landscape and visual effects of the proposed development.

5.2.4 The lighting scheme proposed would be little different from that for the consented scheme, with only minor changes in the location of lighting columns to reflect the localised changes in the development footprint.

5.2.5 A landscape scheme has been partially implemented as part of the consented waste facility development. This includes both deciduous and coniferous tree and shrub species on the bund at the southern edge of the wider Easter Langlee waste management complex. The planting ties in with the existing planting present on the bund to form a visual screen to views from the south. A yet to be implemented meadow mix, including wildflowers, would be seeded on the localised earthworks that are associated with the consented waste facility.

5.2.6 It is not proposed to change the fundamentals of the landscape scheme as part of the proposed development. The footprint of the proposed development would be slightly different from that of the consented development and as such, the area of Dogwood shrub planting that formed part of the consented landscape scheme is not proposed as part of the current proposal. This change to the consented landscape scheme is reflected on Figure 5.3.

5.2.7 As the consented landscape scheme includes planting of Ash trees (which were planted during 2012), management and maintenance of this planting should include regular monitoring of Ash, in order to inspect for the presence of Ash dieback. An Aftercare and Management strategy was produced in relation to the consented development (see Appendix 5-3 for further details).

5.2.8 Given the current situation in relation to Ash, including the prohibition on the movement of Ash trees, the following additional management / maintenance measures are proposed. These are illustrated in Table 5.1 below.

Table 5.1: Additional Management Maintenance Measures

Additional Management/Maintenance Items		
Maintenance Year	**Operation**	**Frequency**
1-5	Monitor all Ash specimens for signs of Chalara Ash dieback	On-going / each visit
	Any Ash specimens infected with Chalara Ash dieback to be dealt with in accordance with current best practice guidance produced by the Forestry Commission and/or DEFRA.	On-going / each visit
1-5	All failed Ash specimens to be replaced in the next available planting season with other species as indicated on Figure 3.	x1 as required – November-March

5.3 Planning and Policy Background

5.3.1 For full details of the planning and policy background that relates to the proposed development site, refer to Chapter 4.0 and Appendix 4-1 of this ES. Key policies in relation to landscape and visual matters are summarised below. Of most relevance is that the site is not within any areas carrying landscape designations.

5.3.2 Paragraph 127 of *Scottish Planning Policy* (Scottish Government 2010) identifies that: "*…the siting and design of development should be informed by local landscape character…*"

5.3.3 Paragraph 137 of the same document identifies that, in respect of National Scenic Areas (NSAs), development should: "*…only be permitted where:*

- *It will not adversely affect the integrity of the area or the qualities for which it has been designated, or*
- *Any such adverse effects are clearly outweighed by social, environmental or economic benefits of national importance*".

5.3.4 *The Scottish Borders: The New Way Forward. Scottish Borders Structure Plan 2001-2018* (approved 2002) includes strategic policies for the Scottish Borders area. Policy N9 of the Structure Plan identifies that: "*Proposals for development and land use change will be guided by the Scottish Borders Landscape Character Assessment with the aim of maintaining the integrity of the landscape character and enhancing its quality…*"

5.3.5 Policy N10 of the Structure Plan relates to NSAs, but the policy specifically refers to development within NSAs only.

5.3.6 Similarly, Policy N11 relates to development within Areas of Great Landscape Value, a local-level, non-statutory landscape designation.

5.3.7 More detailed and site-specific policies are set out in the *Scottish Borders Consolidated Local Plan* (adopted 2011). Policy Inf7 of the Local Plan identifies that, in relation to proposed waste management facilities, the impact on the landscape will be a key consideration, and also that provision for structural landscaping, screening and boundary treatments may be required by the Council in any application.

5.3.8 *Local Landscape Designations* (published 2012) is a supplementary planning guidance document, which provides a review and update of local landscape designations within the Scottish Borders. The document proposes the replacement of the extant AGLV designation with a new Special Landscape Area (SLA) designation, whose presence is justified via a robust methodology. Policy A of the SPG states that the Council will apply the SLA boundaries.

5.4 Methodology

5.4.1 This update follows the same methodology that was included in the LVIA for the consented waste facility (see Appendix 5-1), and which accords with current best practice as set out in *Guidelines for Landscape and Visual Impact Assessment* (Landscape Institute and Institute of Environmental Management and Assessment, second edition 2002).

5.4.2 A third edition of the GLVIA is anticipated to be published in April 2013. Transitional guidance has been prepared by the Landscape Institute in respect of whether to use the second or third editions of GLVIA when preparing LVIA. This guidance is set out in Appendix 5-2. As the current LVIA was prepared prior to publication of the third edition of GLVIA it is considered that use of the second edition is appropriate in this instance.

5.4.3 To ensure consistency and clarity with the previous LVIA for the consented MBT facility, the current LVIA has used the same criteria for receptor sensitivity and magnitude of change as set out in Appendix 5-1.

5.4.4 Significance of effect has been determined using the matrix set out in Table 5.2 below. This differs from that set out in Appendix 5-1 in that where a negligible magnitude of change is occurred (defined in Appendix 5-1 as minimal or no change in character; not visible or may go unnoticed), then it is considered that the resultant effect would also be negligible.

Table 5.2: Assessment Matrix

Magnitude of Change	***High***	*Moderate*	*Moderate/ Major*	*Major*
	Medium	*Moderate/ Minor*	*Moderate*	*Major/ Moderate*
	Low	*Minor*	*Moderate/ Minor*	*Moderate*
	Negligible	*Negligible*		
		Low	***Medium***	***High***
		Sensitivity of Receptor		

NB: Grey shading indicates a potentially significant effect in EIA terms.
Example: A large magnitude of change on a receptor with a low sensitivity to change results in an effect of minor to moderate significance.

5.5 Baseline

5.5.1 The presence of the consented waste facility at the site is considered to be part of the LVIA baseline. The facility has planning consent (which has been implemented), with the exception of the changes covered by the application to which this LVIA relates, it will be constructed fully at the same time as the ATT plant.

The Site and its Surroundings

5.5.2 The proposed development site is located within the wider Easter Langlee waste management complex at the north-eastern edge of Galashiels (approximately 3km from the centre of town). The waste management complex includes an operational landfill and associated ancillary infrastructure (to the north-east, north and west of the proposed development site). The southern boundary of the proposed development is defined by a bund at the edge of the wider waste management site. Part of the southern edge of this bund is planted with conifer trees. Further, predominantly deciduous, planting was implemented during 2012, as part of the planning permission for the consented waste facility. An overhead transmission line crosses the site and pylons are present in the surrounding fields.

5.5.3 The land to the west, north and east of the Easter Langlee waste management complex is largely agricultural in use, comprising predominantly regular-shaped fields, with patches of tree cover scattered throughout. Immediately east of the site is the Allan Water, a stream which flows southwards into the River Tweed. East of the Water is an area of unenclosed grassland on Avenel Moss.

5.5.4 To the south, the site is located close to the edge of Galashiels. A new housing development is under construction to the south and the nearest property is to be located approximately 180m to the south-west.

5.5.5 Further south, the River Tweed flows from west to east. The valleys of the river and its tributary, the Gala Water, are well settled, with several small towns and villages present. The distinctive landform of the Eildon Hills is a recognisable feature on the southern side of the valley. Abbotsford House, located on the banks of the Tweed to the south-east of Galashiels is included on the Inventory of Gardens and Designed Landscapes and has important cultural associations as the home of the novelist Sir Walter Scott. A second Inventory Landscape is located at Chiefswood, immediately south of the Borders General Hospital.

Landscape Designations

5.5.6 The Eildon and Leaderfoot NSA lies approximately 1.5km south-east of the proposed development at the closest point (refer to Figure 5.1 for location). The NSA designation was established under Circular 20/1980, Development Control in National Scenic Areas. The designation covers areas of "*national scenic significance…unsurpassed attractiveness which must be conserved as part of our national heritage*"[2].

5.5.7 Special qualities of the Eildon and Leaderfoot NSA were set out in *The special qualities of the National Scenic Areas. SNH Commissioned Report No.374* (Scottish Natural Heritage 2010). These include:

- Great landscape diversity within a compact area;
- The distinctive triad of the Eildon Hills;
- Spectacular views from hill summits;
- A strongly united landscape pattern of lively rhythm and colour;
- A richly wooded scene of great variety;
- The Tweed, an iconic river of international renown;
- A rich array of historic buildings, structures and estates;
- The hub of Border settlement;
- A harmonious and varied prospect from unequalled viewpoints;
- Inspiration for the arts, literature and painting;
- Border country ballads and battles;
- The historic crossings of Leaderfoot;
- Scott's View; and
- The Wallace Statue.

5.5.8 The effects of the consented waste facility upon the NSA were not considered significant (see Appendix 5-1 for further details).

5.5.9 The Tweed, Ettrick and Yarrow Confluences Special Landscape Area (SLA) is located approximately 1.5km south of the proposed development site at the closest point (refer to Figure 5.1 for location). SLAs are local, non-statutory designations protected by local planning policy (as referred to above).

2 *Scotland's Scenic Heritage* (Countryside Commission for Scotland) 1978.

5.5.10 A Statement of Importance in relation to the Tweed, Ettrick and Yarrow Confluences SLA is set out in *Local Landscape Designations* (Scottish Borders Council 2012). Key points include:

- Strong sense of place;
- Contains representative border features, albeit each valley retains its own character;
- Enclosing uplands and upland fringes offer contrast and an attractive wider setting;
- Views along the valleys; the descending approach to Selkirk along the A699 being particularly scenic;
- Valley sides form part of the setting of Galashiels, Tweedbank and Melrose; and
- Southern Upland Way passes through the area, and there are numerous other paths.

Landscape Character Assessment and Other Studies

5.5.11 The Borders landscape assessment Scottish Natural Heritage review No. 112 (Ash Consulting Group 1998) subdivides the landscape of the Scottish Borders into a series of thirty landscape types, some of which are further subdivided into geographically distinct landscape character areas.

5.5.12 The proposed ATT plant development would be located within landscape type 27: Upland Fringe Valley with Settlements (Tweed/Gala/Ettrick confluence landscape character area). Landscape type 12: Undulating Grassland (East Gala landscape character area) is located approximately 250m to the north-east of the development site. The location of both landscape types is indicated on Figure 5.1.

5.5.13 Key characteristics of landscape type 27 include:

- Medium to large scale flat bottomed valley, enclosed by undulating upland fringe hills;
- Smooth large scale landform modified in places by undulating moraine deposits, steep bluffs and terraces cut by meandering river;
- Neat pattern of medium sized arable and pasture fields, divided by hedgerows, often with mature trees;

- Mature broadleaf woodlands and shelterbelts prominent along the valley floor and lower slopes; and
- Coniferous woodlands on valley sides contrasting with pastures, often well integrated into landscape.

5.5.14 Key characteristics of landscape type 12 include:

- Large scale, moderately to steeply sloping and undulating landform incised in places by steep gullies and narrow valleys;
- Land cover characterised by improved pastures divided by drystone dykes and scattered small to medium sized coniferous plantations;
- Medium density settlement with small villages and farmsteads sited in typically sheltered valleys and on lower slopes; and
- A simple, uniform valley of smooth flowing curves, open in character with distant views over adjoining valley types and the Lammermuir and Moorfoot Hills.

5.5.15 The East Gala landscape character area (within landscape type 12) is described as including the following distinctive features:

- Moderately to strongly undulating, with both gentle and steep slopes;
- Locally prominent medium sized conifer plantations; and
- Locally intrusive pylon lines.

5.5.16 The effects of the consented waste facility upon landscape character were not considered to be significant (see appendix 5-1 for further details).

Visual Baseline

5.5.17 The LVIA for the consented waste facility identified that the development site is well contained by a combination of landform and vegetation cover and that as such views of the facility would be confined to the immediate locality.

5.5.18 The LVIA for the consented waste facility also included a Zone of Theoretical Visibility (ZTV) map. This has been updated as part of the current LVIA to reflect the proposed 23m high exhaust. It should be noted that the ZTV is based upon a bare earth model which does not include vegetation, buildings or other structures. These features can often provide significant screening of

views. Additionally, the ZTV does not take account of the restored areas of Easter Langlee landfill site.

5.5.19 Visual receptors identified in the LVIA for the consented waste facility include:

- Five representative viewpoints, as follows:
  - 1: Langshaw Road (Coopers Knowes);
  - 2: Southern Upland Way (Gateside Bank);
  - 3: Easter Langlee Farm;
  - 4: Langlee Mains; and
  - 5: Landfill site entrance.
- Core path 19;
- National Cycle Route 1;
- Properties on Abbotsford Road, Galashiels;
- Properties in Langlee;
- Properties in Netherdale, Darnick and Tweedbank;
- Pavilion Farm;
- Langlee Mains;
- Wester Housebyres Farm;
- Properties at Coopersknowe, Easter Langlee; and
- Easter Langlee Farm.

5.5.20 Updated photography from each of the five viewpoints identified above is presented on Figures 5.4a-c.

5.5.21 None of the visual effects identified in the LVIA for the consented waste facility were considered to be significant (see Appendix 5-1 for further details).

5.5.22 New visual receptors have emerged following the grant of planning permission for the consented waste facility. These comprise the consented residential development to the south of the site, where a number of housing units (two-storey) are presently under construction.

5.6 Assessment of Effects

Landscape Fabric

5.6.1 The fabric of the site comprises the existing waste management infrastructure and the consented MBT development with its associated landscape scheme (largely implemented during 2012). The sensitivity of the built elements of the site is considered to be low. The sensitivity of the perimeter planting is also considered to be low as this could easily be substituted by replacement planting given its immaturity.

5.6.2 It is not proposed to change the fundamentals of the landscape scheme as part of the proposed development. The footprint of the proposed development would be slightly different from that of the consented development; as such, an area of shrub planting at the site entrance has been omitted from the proposals, and the extent of meadow seeding at the eastern end of the development would be reduced. It should be emphasised that all other elements of the consented landscape scheme (much of which has been implemented during 2012) remain unchanged. The amended landscape scheme is shown on Figure 5.3.

Landscape Character

5.6.3 The sensitivity of both landscape type 27: Upland Fringe Valley with Settlements and landscape type 12: Undulating Grassland are considered to be high, in accordance with the previous assessment contained within Appendix 5-1.

5.6.4 The proposed buildings would not be appreciably different in size or scale than the consented buildings and as such, their influence upon the surrounding landscape would be no different. The presence of the proposed exhaust would introduce a new element; however existing vertical features (pylons) are present in the immediate surroundings of the site.

5.6.5 Change in character would be negligible in magnitude upon both landscape type 27 and landscape type 12. In both cases, the resultant significance of effect would be negligible.

Visual Effects

5.6.6 The visual influence of the proposed development would not be appreciably different than that of the consented waste facility, with the exception of the proposed exhaust. The exhaust would, by virtue of its greater height, be visible over a wider area than the proposed or consented buildings. However, it would comprise only a single point feature in views from the surrounding area.

ZTV

5.6.7 The ZTV prepared for the proposed development indicates the theoretical visibility of the proposed main building and of the proposed exhaust (refer to Figure 5.1 for ZTV). It can be seen by reference to this Figure, that the presence of the exhaust would result in only a limited increase in the theoretical visibility of the development. Areas where only the proposed exhaust would be theoretically visible are mainly located along the Tweed Valley, where in reality considerable screening of views is provided by both buildings and vegetation cover. Furthermore, in virtually all locations, particularly more distant ones, from which the exhaust may be seen, it will be viewed against a backdrop of land and vegetation.

5.6.8 The top of the proposed exhaust would reach a height of 157m AOD (23m above ground level). The topography rises steeply in elevation north of the site, reaching a high point of 275m to the north-east (approximately 1.3km from the proposed development) and 317m to the north-west (approximately 2km from the proposed development). Only a small area of land in the bottom of the valley of the Allan Water is lower than the height of the proposed exhaust; however the landform enclosing this small valley to the north is over 200m AOD in height. As such, in views from the south, where such views are not encumbered by the presence of vegetation or other features, the proposed exhaust, whilst sometimes visible, would not break the skyline. The

presence of electricity pylons as existing vertical features located on the higher ground west of the site should also be noted.

Sections

5.6.9 A series of sections have been prepared to indicate the line of sight towards the proposed development from the consented housing development located to the south (refer to Figure 5.2 for the orientation of the sections). These sections show the planting on the bund at the southern edge of the wider waste management site (which was implemented during 2012) at a height of 5m. It is anticipated that planting would reach this height approximately 10 years after planting, i.e. by 2022.

5.6.10 The sections include lines of site from houses based both upon bare earth only and upon the presence of planting on the bund. The sections demonstrate that the visibility of the proposed development from the consented housing would be limited, due to the change in level between the houses and the development. Parts of the development (exhaust and building roof) are likely to be visible from some properties towards the south of the consented housing area initially. However, the planting implemented during 2012 will, in time, provide a defined and naturalistic edge to the wider waste management site and will screen views from the consented housing.

Viewpoints

5.6.11 Five viewpoints were included in the LVIA for the consented waste facility. Updated photographs (taken in winter 2013) from each of these locations looking towards the proposed development are presented on Figures 5.4a-c.

5.6.12 The sensitivity scores allocated to each receptor in the previous assessment contained within Appendix 5-1 have been reviewed as part of the current LVIA. Viewpoints 1 and 5 remain low sensitivity, and viewpoint 4 remains medium sensitivity, as per the previous assessment contained within Appendix 5-1.

5.6.13 The sensitivity scores for viewpoints 2 and 3 have been increased to high. Viewpoint 2 is from the Southern Upland Way, which is a promoted strategic walking route. Viewpoint 3 represents direct views towards the development site from residential properties. In both cases, a high sensitivity is justified.

5.6.14 At Viewpoint 1: Langshaw Road (Coopers Knowes), the proposed ATT plant development would be largely hidden from view by the restored landfill (the ZTV on Figure 5.1 does not take account of this). The top of the proposed exhaust may be visible above this, but would constitute only a minor intrusion. The balance of the view and composition of features would not change. Change would be negligible in magnitude, with a resultant effect of negligible significance.

5.6.15 At Viewpoint 2: Southern Upland Way (Gateside Bank), the proposed ATT plant development would be visible to the west. The development would appear virtually identical to the consented MBT facility. The proposed exhaust would be visible as a minor new feature, in a context where existing and consented development is already visible at the waste management site and in Galashiels. The presence of the exhaust would not affect the nature of the baseline view or the balance of features within it. Change would be negligible in magnitude, with a resultant effect of negligible significance.

5.6.16 At Viewpoint 3: Easter Langlee Farm the proposed ATT plant development would be largely screened from view by the existing mature belt of conifer trees that are present along the south-western boundary of the wider waste management site. Filtered views of the development may be available from some of the adjacent properties through breaks in the tree belt. As the planting implemented during 2012 matures, screening of these views will increase. The introduction of the proposed exhaust would not appreciably change the baseline view, with tree cover continuing to obscure clear views of the proposed ATT plant development. Change in view would be negligible, with a resultant effect of negligible significance.

5.6.17 At Viewpoint 4: Langlee Mains, the proposed ATT plant development would be visible in the valley to the east. The proposed exhaust would be a very minor feature and its presence may not be apparent to the casual observer.

The composition of the baseline view would be unaffected. Change in view would be negligible, with a resultant effect of negligible significance.

5.6.18 At Viewpoint 5: Landfill site entrance, the proposed ATT plant development would be largely hidden from view by vegetation cover and bunding at the roadside and by other features within the site. The proposed exhaust would be visible above this, but would be viewed in the context of an operational waste management site. Change in view would be low in magnitude and the resultant effect would be minor in significance.

Wider Pattern of Visual Effects

5.6.19 In the wider context, change in view resulting from the proposed development would be minimal. The proposed exhaust would form a new presence in views from the surrounding area, including from Eildon Hill, but views are already influenced by pylons and other development in the Tweed Valley. The remainder of the proposed development would not be appreciably different from what is consented. Visual effects would not be significant.

Night-time Effects

5.6.20 Night-time effects resulting from the proposed development would not be appreciably different from those of the consented development. The proposed lighting scheme would be designed to the same specification as the consented scheme and would generate the same lighting levels. There would be no significant effects arising.

5.7 Conclusions

5.7.1 The proposed development would be introduced into a context where a similar facility in the same location already benefits from planning consent. The sole appreciable difference between the proposed and consented development in landscape and visual terms would be the introduction of the proposed exhaust. This limited change would not give rise to significant adverse effects upon the landscape (fabric and character) or upon views.

6.0 NOISE AND VIBRATION

6.1 Introduction

6.1.1 This chapter of the ES assesses the impacts of the proposed ATT plant development with regard to noise and vibration. It describes:

- The methods used to assess the impacts of the ATT plant development;
- The baseline conditions that are currently being experienced at the site and the typical existing site noise climate;
- The nearest noise sensitive receptors to the proposed development;
- The potential direct and indirect impacts arising from the proposed development (including the noise impact upon existing and proposed residential dwellings from site noise sources); and
- The mitigation measures that are required to ensure that the operations at the site comply with the requirements of contemporary noise standards and guidance.

6.1.2 The assessment utilises information contained within the noise survey that was carried out in February 2011 as part of the noise assessment that was submitted in support of the planning application for the consented waste facility.

6.1.3 Appendix 6-1 provides details of the technical terms used within the chapter, for ease of reference. In addition, it also provides a chart showing typical everyday noise levels to assist the readers understanding of the subjective level of noise in terms of decibels.

6.2 Regulatory, Planning and Policy Context

6.2.1 The following section outlines the key planning policy and guidance that relates to the assessment of residential amenity and protection of residents from general environmental and industrial noise sources.

Control of Pollution Act 1974

6.2.2 Sections 60 and 61 of the Control of Pollution Act 1974 give local authorities special powers for controlling noise arising from construction and demolition works on any building or civil engineering sites. Section 60 enables the local authority to serve a notice of its requirements for the control of site noise. The notice can perform the following functions:

- Specify the machinery that is or is not to be used;
- Specify the hours during which the construction work can be carried out; and
- Specify the level of noise that can be emitted from the premises.

6.2.3 Section 61 outlines the procedure that is to be adopted when a contractor takes the initiative and approaches the local authority to ascertain its noise and vibration requirements prior to the commencement of construction work.

6.2.4 It is not mandatory for applications for consents under Section 61 to be made, but it will often be in the interest of a contractor or their agents to apply for consent, because once a consent has been granted, a local authority cannot take action under Section 60 or Section 80 of the Environmental Protection Act 1990, so long as the consent remains in force and the contractor complies with its terms.

British Standard (BS) 4142:1997

6.2.5 BS4142:1997 is based on the measurement of background noise using LA90 noise measurements compared to source noise levels measured in LAeq measurements. The differential between the two measurements (once any corrections have been applied for source noise tonality, distinct impulses etc. i.e. rating level) determines the likelihood of complaints. If the difference between the 'rating' level and background is +5dB(A), then the standard says that the noise is of marginal significance; if the differential is +10dB(A) then complaints are likely.

BS5228:2009 'Code of Practice for Noise and Vibration Control on Construction and Open Sites'

6.2.6 BS5228:2009 refers to: *"the need for the protection against noise and vibration of persons living and working in the vicinity of, and those working on, construction and open sites. It recommends procedures for noise and vibration control in respect of construction operations and aims to assist architects, contractors and site operatives, designers, developers, engineers, local authority environmental health officers and planners."*

6.2.7 Part 1 deals with noise in terms of background legislation and gives recommendations for basic methods of noise control relating to construction and open sites where significant noise levels may be generated. The guidance is aimed at giving advice on achieving 'best practice' in controlling noise and vibration from construction and open sites. There is an example of noise limits given in Annex E, which sets out cut-off limits between 65dB(A) and 75dB(A) or 5dB(A) above the ambient noise, whichever is the greater. Part 2 of BS5228:2009 deals specifically with vibration control and provide the legislative background to the control of vibration and recommendations for controlling vibration at source and management controls (e.g. liaison with communities, supervision, preparation and choice of plant etc.)

Planning Advice Note (PAN) 1/2011 Technical Advice Note Assessment (TANAN)

6.2.8 Planning Advice Note (PAN) 1/2011 Technical Advice Note Assessment (TANAN) provides guidance on the quantitative and qualitative assessment of the noise impact from noise generating developments that are located close to noise sensitive receptors (NSR).

6.2.9 For the quantitative assessment guidance given in BS4142:1997 is used. For the qualitative assessment various measures and assessment methods are given. The outcomes of both the quantitative and qualitative assessments are used to determine the noise impact of a development on nearby NSRs. 'Magnitude of Impact' due to a noise generating development (NGD) is determined by considering the decibel noise level difference between the

after development (ambient) and before development (residual) noise levels from which suitable qualitative measures are obtained.

6.2.10 The relationship between the noise level difference and the 'magnitude of impact' scale is given in Table 6.1.

Table 6.1: Magnitude of impact scale for differences in after and before development noise levels

Difference (ΔLp[(1)]) /dB(A)	Magnitude of Impact
ΔLp ≥ 5	Major
3 ≤ ΔLp ≤ 4.9	Moderate
1 ≤ ΔLp ≤ 2.9	Minor
0.1 ≤ ΔLp ≤ 0.9	Negligible
ΔLp = 0	No change

(1) Lp = Ambient (after development) – Residual (before development) both in $L_{Aeq,T}$

6.2.11 The number of NSRs is determined by comparing the likelihood of complaints sensitivity and the 'magnitude of Impact'. This results in a seven step subjective scale ranging from 'Neutral', representing no change between the 'after development' and 'before development' noise levels, to 'Large / Very large', representing a minimum change of 5dB(A) in the 'magnitude of impact' while being assessed by BS4142: 1997 as 'complaints are likely'. This is shown in Table 6.2 over the page.

Table 6.2: Impact Magnitude Rating

Magnitude of Impact	**Number of noise sensitive receptors based on the likelihood of complaint sensitivity and magnitude of impact.**		
Difference (ΔL_{Aeq}[(1)]) / dB(A)	**Low ΔLp[(2)] <5dB(A)**	**Medium 5dB(A) ≤ ΔLp[(2)] < 10dB(A)**	**High 10dB(A) ≤ ΔLp[(2)]**
Major (ΔLp ≥ 5)	Slight / Moderate	Moderate / Large	Large / Very Large
Moderate (3 ≤ ΔLp ≤ 4.9)	Slight	Moderate	Moderate / Large
Minor (1 ≤ ΔLp ≤ 2.9)	Neutral / Slight	Slight	Slight / Moderate
Negligible (0.1 ≤ ΔLp ≤ 0.9)	Neutral / Slight	Neutral / Slight	Slight
No change (ΔLp = 0)	Neutral	Neutral	Neutral

(1) ΔL_{Aeq} = Ambient (after development) – Residual (before development) both in $L_{Aeq,T}$
(2) ΔLp = Rating Noise ($L_{Ar,Tr}$) – Background Noise ($L_{AF90,T}$)

6.2.12 According to PAN1/2011TANAN residential properties are categorised as having "High" level of sensitivity. Therefore, it is important that this sensitivity

is not confused with the three sensitivities given in Table 6.2 that refer to the likelihood of complaints sensitivity of a NSR.

6.2.13 The significance scale is based on key benchmarks that relate to the human perception of sound. For noise which is very similar in all respects except magnitude, a change or difference of 1dB is considered to be just perceptible under controlled laboratory conditions, whereas a change or difference of 3dB is considered to be just perceptible under most normal conditions.

Guidance on Ground Vibration

6.2.14 Most of the available data relating to the effects of ground vibration on buildings have been obtained during tests using explosives. From these studies, two regimes of building damage have evolved, those of structural damage involving major failures of whole or parts of buildings and architectural damage involving cracking plaster or other brittle materials.

6.2.15 Architectural, sometimes called cosmetic, damage is thought to be more annoying than dangerous and would start to occur at lower levels of vibration than structural damage. Recent International and British Standards define and categorise building damage under three main headings:

a) Cosmetic - the formation of hairline cracks on drywall surfaces or the growth of existing cracks in plaster or drywall surfaces. In addition, the formation of hairline cracks in mortar joints of brick / concrete block construction.
b) Minor - the formation of large cracks or loosening and falling of plaster or drywall surfaces, or cracks through bricks / concrete blocks.
c) Major - damage to structural elements of the building, cracks in support columns, loosening of joints, splaying of masonry cracks, etc.

6.2.16 An investigation into the effects of induced vibration undertaken by the British Standards Institution has culminated in BS7385:1993; Part 2 which gives guide values to prevent cosmetic damage to property of 15 to 20mms-1 between 4 Hz and 15 Hz, whilst above 40 Hz the guide value is 50mms-1. The BSI suggests reducing these figures by a factor of 50% for continuous

vibration, for example from rail traffic, thus the values become 7.5-10mms-1 at 4-15 Hz, and 25.0mms-1 at 40 Hz and above.

6.2.17 With regard to the threshold of cosmetic damage, for continuous vibration such as road or rail traffic, levels below 5.0mms^{-1} are unlikely to be significant. For a given level of vibration the risk of damage decreases as the frequency of that vibration increases.

6.2.18 BS5228- 2:2009 Annex B gives guidance on the effects of vibration levels, which is summarised in Table 6.3 below.

Table 6.3: Guidance on Effects of Vibration Levels

Vibration Level (mm.s-1)	Effect
0.14	Vibration might be just perceptible in the most sensitive situations for most vibration frequencies associated with construction. At lower frequencies, people are less sensitive to vibration.
0.3	Vibration might be just perceptible in residential environments.
1.0	It is likely that vibration of this level in residential environments would cause complaint, but can be tolerated if prior warning and explanation has been given to residents.
10	Vibration is likely to be tolerable for any more than a very brief exposure to this level.

6.2.19 In terms of response limits of buildings BS5228-2: 2009 (Annex B, Table B.2) refers to BS7385-1 and BS7385-2 and sets out guide values for transient vibration for cosmetic damage, which gives a low frequency limit of 15mm/sec (4Hz) increasing to 20mm/sec at 15Hz for residential or light commercial buildings. For reinforced or framed structures the limit is 50mm/sec at 4Hz and above.

Vibration Nuisance

6.2.20 The fact that the human body is very sensitive to vibration can result in subjective concern being expressed at energy levels well below the threshold of damage.

6.2.21 Guidance on the human response to vibration in buildings may be found in British Standard BS6472-1:2008. Weighting curves related to human response to vibration of buildings are presented within this document. Estimates are given on the probability of adverse comment, which might be expected, from human beings experiencing vibration in buildings. This is based on a vibration dose value (VDV), assessed from frequency weighted vibration measurements and based on a 16- hour day and 8 hour night period.

Local Policy

6.2.22 Policy INF7 – Waste Management Facilities states that: *"Applications for waste management facilities as defined in this policy will only be approved if it can be satisfactorily demonstrated that the impacts are within acceptable levels and can be both minimised and properly managed. Key impacts that will be considered in this regard comprise:*

- *The impact on local communities, particularly adjacent to the site, in terms of noise, odours and traffic generation".*

Local Authority Suggested Wording of a Planning Condition

6.2.23 As noted in Chapter 2.0 of this ES, SBC have provided a formal EIA Screening Opinion in relation to the proposed development of the ATT plant (see Appendix 2-2). Attached to the Screening Opinion was a series of e-mails and other correspondence provided by various departments within the Council. The response from the Environmental Health Officer indicates that a full noise assessment should be carried out in support of the proposals and that the Council's standard noise condition should be applied to the development in the event that planning permission is granted, this states:

"Noise levels emitted by any plant and machinery used on the premises should not exceed Noise rating Curve NR20 between the hours of 2300 – 0700 and NR30 at all other times when measured with any noise sensitive dwelling (windows can be open for ventilation).

The noise emanating from any plant and machinery used on the premises should not contain any discernible tonal component. Tonality shall be determined with reference to BS 7445-2."

6.2.24 For the purposes of carrying out this assessment it has been assumed that the above condition would apply inside a habitable room with a slightly opened facade window.

6.2.25 The operation of the proposed development has been specifically assessed against the requirements of the suggested planning condition in sub-section 6.6 of this Chapter.

6.3 Methodology for the Production of the Noise Model

Operation

6.3.1 Spreadsheet based noise emission level prediction models have been created to estimate the likely noise emission levels from the proposed ATT plant. In the first instance a spreadsheet model was created (Model I) to estimate the noise emissions from the ATT buildings (advanced thermal conversion building and energy recovery building), together with the 23m high exhaust, 4No. ground level air blast chillers (ABC) (up to 3No. ABCs operating simultaneously) and 2No. 11kV transformers. A second model was created to estimate the likely noise emissions from the biofilter and associated chimney (Model II).

6.3.2 The external surfaces of the buildings were divided into smaller elements and the noise emissions from each individual element were estimated. To calculate the noise emission from each building noise emission levels for individual elements of that building were combined logarithmically. Then the estimated building noise emission levels for each building and noise emission levels due to the external noise sources were combined logarithmically to obtain a single figure noise level. This method of calculation is in accordance with the requirements of BS12354-4:2000[3]. The estimated noise level is

[3] BS12354-4: 2000 "Building acoustics – Estimation of acoustic performance of buildings from the performance of elements" – Part 4: "Transmission of indoor sound to the outside".

called Specific Noise Level in accordance with BS4142:1997[4]. To obtain a single figure Rating Noise Level a +5dB(A) source characteristic feature correction was applied to noise sources. This was based either on the tonality assessment of individual one-third octave spectrum carried out in line with Appendix D of ISO1996-2:2007[5], or likely operational irregularities that might be significant to attract attention. Information on ISO1996-2:2007 tonality assessment, together with an example calculation sheet (based on the guidance given in Appendix D of ISO1996-2:2007) are included in Appendix 6-2.

6.3.3 Direction, distance, soft ground and screening due to the proposed buildings has been taken into account for each building element and external noise source with respect to each receiver position. No soft ground attenuation was applied to exhausts due to their height. However, soft ground attenuation based on the 50% of the propagation path within the point source radiation region was applied in accordance with the guidance given in BS5228-1:2009[6]. This is considered to be a conservative approach. An extract from noise calculation spreadsheet model Model I is given in Appendix 6-3 as an example.

Source / Process Noise Levels Used in Noise Models

6.3.4 The octave band centre frequency and corresponding broadband A-weighted sound levels used in the models when internal plant / process are included are shown in Table 6.3 overleaf.

6.3.5 Noise data has been derived where possible from operational noise measurements obtained at NES's waste treatment facility at Avonmouth, near Bristol which employs a number of similar processes. The remaining noise data has been derived using the manufacturer's information on plant / processes.

[4] BS4142: 1997 "Method for rating industrial noise affecting mixed and residential and industrial areas".
[5] Annex D "Objective method for assessing the audibility of tones in noise-Simplified method" of ISO1996-2: 2007- "Description, measurement and assessment of environmental noise" - Part 2: "Determination of environmental noise levels"
[6] BS5228-1:2009 "Code of practice for noise and vibration control on construction and open site" – Part 1: "Noise".

Table 6.4: Sound Pressure Levels Used in the Noise Models

Source / Process sound levels								
Description	**Octave Band Centre Frequency**						**Broadband dB(A)**	**Assumed Percentage of On Time**
	125Hz	**250Hz**	**500Hz**	**1kHz**	**2kHz**	**4kHz**		
Reception Hall (based on sound levels measured at Avonmouth MBT facility reception)	92	86	86	85	82	82	90	100% (Day)[1] 10% (Night)[2]
Link Corridor (based on sound levels measured at Avonmouth MBT facility)	76	78	78	82	78	69	84	100% (Day)[1] 25% (Night)[2]
Mechanical Treatment/Dryer (based on data used for Avonmouth LowCEF and data provided by NES)	73	73	77	80	77	69	83	100% (Day)[1] 50% (Night)[2])
Advance Thermal Conversion Building (based on data confirmed by NES)	51	55	61	62	64	59	68	100% (Day)[1] 100% (Night)[1]
Energy Recovery Building (assumes each engine is fitted with at least a primary silencer and is in an acoustic enclosure)	73	67	72	71	73	69	78	100% (Day)[1] 100% (Night)[1]
Biofilter Building (calculated from compost systems fan HL8.7 FU data and related duct, dimension, velocity, material data provided by NES)	73	70	70	68	67	64	74	100% (Day)[1] 50% (Night)[2]

[1] NES assumption.
[2] Atkins assumption.

6.3.6 External plant noise levels used in the models are shown in Table 6.5 below. Also included in this table is the assumed percentage of noise source on-times in terms of day time and night time periods.

Table 6.5: Sound levels used in the noise models for either externally located sources or sources with external connections

External Noise Sources		
Description	**Broadband dB(A)**	**Assumed Percentage of On Time**
Exhaust (23m high) at 10m (after noise control measures) (calculated using Caterpillar engine data and related data provided by NES)	58	100% (Day) 100% (Night)
Biofilter chimney (13.5m) at 10m (calculated using data provided by NES)	38	100% (Day) 100% (Night)
11kV 25000kVA Transformer at 4m (based on measured sound levels from a similar site)	61	100% (Day) 100% (Night)
Air Blast Chiller at 1m (noisiest side) (based on data provided by NES)	75	100% (Day) 100% (Night)

Airborne Sound Reduction Indices of Building Materials Used in Noise Models

6.3.7 Airborne sound insulation performances for the materials forming the building shell used in the models are shown in Table 6.6 over the page. It is assumed that they would be representative of the airborne sound insulation performances of the candidate materials and the acoustic integrity of the building would not be compromised, for example, by having poor wall / roof panel perimeter joints.

Table 6.6:-Building material sound insulation figures used in the noise emission prediction models

Airborne Sound Reduction Indices of Materials forming the Building Fabric								
Building	**Description**	**Octave Band Centre Frequency**						**R`w**
		125Hz	**250Hz**	**500Hz**	**1kHz**	**2kH**	**4k H**	
Mechanical Treatment	External walls and roofs	15	17	21	17	26	35	22
	External walls (see the marked up drawing for application location)	13	27	37	38	38	38	35
	Roofs (see the marked up drawing for application location)	16	33	38	38	38	38	37
	Roof lights	6	11	18	18	18	18	18
	Personal access doors	19	26	31	35	35	35	34
	Roller shutter doors	9	10	14	17	20	24	17
Biofilter Building	External walls	10	17	21	26	30	33	26
	Roof	6	12	16	21	24	24	20
Both Buildings	Ventilation (free opening)	0	0	0	0	0	0	

Receptors

6.3.8 Table 6.7 identifies the noise sensitive receptors (NSRs) that have been considered in the assessment. It also provides approximate distances from the property to the nearest building facade.

Table 6.7: Noise Sensitive Receptors (NSRs)

Receptor Location	**Direction from proposed development**	**Distance from proposed development**
30 Loan View (long term noise monitoring position)	South-west	430m
Nearest house on Coopersknowe Crescent	South-west	330m
Drymen No. 186 - future residential development (ref. Persimmon Homes drawing 02-01/E)	South	180m
Easter Langlee Farmhouse	South	~250m
Lowood Lodge (other side of B6374)	South	~680m
Cottage near B6374	Southeast	~810m
Wester Housebyre near Davie's Brae	Northeast	~790m

6.3.9 The location of the NSRs (and associated noise monitoring positions) and the site of the proposed ATT plant development are illustrated on Figure 6.1.

6.4 Baseline

Environmental Noise Surveys

6.4.1 A detailed environmental noise survey was carried out at the site in 2011 as part of the noise assessment undertaken by RPS in connection with the consented waste facility. The assessment was carried out in two locations in the vicinity of the site, these are:

- Position 1 – 30 Loan View (a residential property on Coopersknowe Crescent); and
- Position 2 – land to the south east of the proposed development site.

6.4.2 This data has been used to inform this noise assessment.

6.4.3 **Position 1:** The residential properties on Coopersknowe Crescent are some of the nearest NSRs. The previous baseline surveys comprised a long-term unattended noise survey at 30 Loan View, Coopersknowe Crescent, which is circa 430m to the south-west of the site. This noise monitoring position is considered to be representative of the other nearby NSRs that are located in similar positions with respect to the existing noise sources such as the nearby roads. The noise levels were measured at this position between Friday, 14th and Monday, 24th January 2011.

6.4.4 **Position 2:** noise levels were also measured at a position located towards the south-east of the proposed development site. It is understood that noise levels were only measured during day time at this position. At this short-term attended measurement position several 15-minute long samples were obtained.

6.4.5 The long-term unattended and short-term attended noise survey locations are illustrated as locations 'A' and 'H', respectively in Figure 6.1.

Baseline Survey Results

6.4.6 The survey logged measurements during the period 14th to 24th January 2011. It was undertaken at a free field location with the microphone at a height of 1.5m above ground level and a minimum of 3.5 m from any

reflecting surface. The instrumentation was mounted in a sealed weatherproof box with full outdoor microphone protection (RPS 2011).

6.4.7 The baseline noise survey was undertaken to identify the ambient noise levels in the area potentially at risk of exposure to noise from the proposed ATT plant.

6.4.8 The long-term measurement location at 30 Loan View was sheltered from the wind by the surrounding houses. It is understood that noise from existing landfill operations, open windrow composting activities and activities associated with the aggregates depot, including traffic, was not audible during the survey period.

6.4.9 Figure 6.2 shows the time history of the long-term noise monitoring. Table 6.8 below presents the baseline noise survey results from the measurement position at 30 Loan View.

Table 6.8: Baseline noise survey (extract from RPS report dated 05/09/2011 Rev.3)

Date at Start of Period	Daytime (0700 – 2300)			Night time (2300 – 0700)			Wind Speed
	$L_{Aeq, 16h}$ (dB)	L_{AF90} (dB)	Hours in dataset	$L_{Aeq, 16h}$ (dB)	L_{AF90} (dB)	Hours in dataset	
Friday - 14/01/2011	50	44	8.75	44	40	6	> 5m/s
Saturday - 15/01/2011	47	45	7	46	43	1	> 5m/s
Sunday -16/01/2011	46	44	11	42	39	6	> 5m/s
Monday -17/01/2011	46	43	16	36	35	7	> 5m/s
Tuesday - 18/01/2011	49	42	14	36	34	3	> 5m/s
Wednesday - 19/01/2011	49	41	16	37	36	8	> 5m/s
Thursday - 20/01/2011	44	42	15	38	36	8	> 5m/s
Friday - 21/01/2011	45	42	16	36	34	8	> 5m/s
Saturday - 22/01/2011	43	39	16	35	33	8	> 5m/s
Sunday - 23/01/2011	40	37	16	35	34	7	> 5m/s
Minimum	40	37	All Day	35	33		
Mean	**46**	**42**		**39**	**36**		
Maximum	50	45		46	43		
Minimum	40	37	18 – 23 January	35	33		
Mean	**45**	**41**		**36**	**35**		
Minimum	49	42		38	36		

6.4.10 Results of the short-term attended noise measurements carried out in both, the field to the south of the proposed development site and 30 Loan View are shown in Table 6.9.

Table 6.9: Attended noise survey results (land to the south) (extract from RPS report dated 05/09/2011 Rev.3)

Date	Time	Edge of Site		30 Loan View	
		$L_{Aeq, 15\text{-}min}$ (dB)	L_{A90} (dB)	$L_{Aeq, 15\text{-}min}$ (dB)	L_{A90} (dB)
14/01/2011	15.20	50	45	49	48
14/01/2011	15.35	46	45	49	47
14/01/2011	15.50	47	44	48	47
24/01/2011	12.45	52	44	52	42
24/01/2011	13.00	48	44	43	41
24/01/2011	13.15	47	43	45	41
Mean Difference (cf. 30 Loan View data)		1	0		

Weather Conditions

6.4.11 Meteorological data obtained to inform the initial noise assessment undertaken in 2011 is shown on Figure 6.2. According to BS4142:1997 noise measurements carried out with wind speed not exceeding 5m/s are considered to be adequate for carrying out BS4142 a 'significance assessment'. This has been taken into consideration in carrying out the noise assessment.

6.5 Incorporated Noise Control Measures

6.5.1 The following section outlines the noise control measures that would be employed at the proposed ATT plant development in order to ensure that the relevant planning guidance noise limits for daytime and night-time operations are achieved.

6.5.2 There are four principal sources of mitigation proposed as part of the ATT plant development which are:

1. Engine exhaust silencers;
2. The installation of plenum or plena;
3. Building insulation; and

4. Vibration control measures.

6.5.3 Each of the aforementioned mitigation measures are described in more detail below.

Engine Exhaust Silencers

6.5.4 It is assumed that each engine is fitted with a primary silencer as indicated in Table 6.10, and this will be placed inside an acoustic enclosure.

Table 6.10: Assumed minimum primary engine exhaust silencer performance figures

Octave Band Centre Frequency in Hz	63	125	250	500	1000	2000	4000	8000
Primary exhaust silencer (Air attenuation figures [(1)])	2.4	3.4	13.5	23.0	32.2	39.6	44.2	41.2

[(1)] Based on Penn Separator Corporation silencer SP 5-24 (length=3.05m, diameter=0.61m)
Note: Transitional ducts may be required at the input and output of silencers. Ensure that transition occurs smoothly to prevent disturbances of the normal air flow.

The installation of Plenum or Plena

6.5.5 In addition to the above mentioned silencers to control the low frequency engine exhaust noise levels, another sound attenuation system would be installed. For this purpose either a single large plenum (a large cavity lined with noise absorbing material) or relatively smaller individual plena for each engine exhaust is proposed (see Figure 6.3). With such measure(s) in place, the sound attenuation figures given in Table 6.11 would be achieved

Table 6.11: Minimum octave band sound attenuation figures to control low frequency noise

Octave Band Centre Frequency in Hz	63	125	250	500	1000	2000	4000	8000
Plenum (Attenuation figures [(1)])	16	18	23	28	31	31	34	34

[(1)] Based on a plenum internally lined with sound absorbent material.

6.5.6 The sound absorbent material should have the minimum octave band sound absorption coefficients given in Table 6.12 overleaf.

Table 6.12: Minimum sound absorption coefficients for the plenum lining material

Octave Band Centre Frequency in Hz	125	250	500	1000	2000	4000
Sound absorbent material absorption coefficients[1]	0.12	0.28	0.55	0.71	0.74	0.83

[1] At the exhaust gas temperature. For the exhaust the temperature is given as 482°C for Caterpillar G3516LE

Building Insulation

6.5.7 It is proposed to control the noise breaking out from the fuel preparation facility and the, Advance Thermal Conversion building and Energy Recovery building associated with the proposed ATT plant by adding insulation to some parts of the proposed internal building fabric.

6.5.8 It is proposed that a 40mm thick composite wall panel KS1000RW40 is lined internally using a 0.7mm thick profiled metal liner and 50mm thick continuous mineral wool insulation (density 33kg/m^3) is placed inside the cavity created (Figure 6.4).

6.5.9 Similarly, it is required to improve the sound insulation performance of the proposed composite roof panel (KS1000RW40). Therefore, it is proposed that a proposed 40mm thick composite roof panel is internally lined using 0.7m thick profiled metal liner and 120mm (or 2No. 60mm) thick continuous mineral wool insulation (density 60kg/m^3) is placed above. This is indicated in the Figure 6.5.

6.5.10 The extent of the proposed external wall and roof treatments are shown in Figure 6.6.

Vibration Control Measures

6.5.11 To prevent transfer of vibrations to the building structure, engine exhaust pipes, exhaust silencers and other pipework that can transfer or generate strong vibrations would be supported off the heavy concrete floor so far as possible. If it is required to support them off the walls or ceilings / roofs of the buildings then it is recommended that resilient supports are be used.

6.5.12 This principle would also be adopted where it is necessary to install mechanical services systems, such as fans and associated ductwork that can generate vibrations.

6.5.13 Similarly, any equipment, machinery and associated pipework that can generate or transfer strong vibrations would be equipped with adequate anti vibration systems if vibration and / or structure-borne sound generation are found to be significant during the detailed design stage.

6.5.14 Potentially noisy machinery and plant would not be positioned close to the external or internal walls to prevent coupling.

6.6 Potential Impacts and Mitigation

6.6.1 This sub-section considers the effects of the proposed ATT plant development in terms of the construction phase, as a result of ground borne vibration and during the operational phase. Each is considered in more detail below.

Construction - Noise

6.6.2 The matter of construction noise was assessed in the noise assessment associated with the consented waste facility at the site. This confirmed that the noise associated with the construction of the facility is unlikely to be significant due to the separation distance between the site and the nearest noise sensitive receptors. It also concluded that, effects during the construction phase would generally only occur during the daytime and would be temporary in duration.

6.6.3 It is not considered that the construction methods that would be adopted in connection with the proposed ATT plant development would be materially different to those associated with the consented waste facility and as such, these conclusions should also apply to the proposed development. This it is not considered that the proposed ATT plant development would give rise to any significant effects during the construction phase.

6.6.4 In addition to the above, and in accordance with BS5228, it is also important to note that best practical means would be employed to control the generation of noise during the construction phase (i.e. using equipment that is regularly maintained, where practicable use equipment fitted with silencers or acoustic hoods).

6.6.5 In consideration of the likely highest levels of construction noise, the following mitigation measures would form part of any construction environmental management plan:

- Restriction of construction hours to non-sensitive times of the day would normally form part of the planning consent conditions;
- Sensible routing of the construction plant to avoid the nearest residential properties;
- Careful choice of piling rigs to minimise noise;
- Avoid un-necessary plant operation and revving of plant or vehicles;
- Locate plant away from nearest sensitive receptors or in locations, which provide good screening in the direction of sensitive receptors; and
- Monitoring of noise levels during peak noise events occurring towards the southern end of the site.

6.6.6 The application best practice in accordance with BS5228:2009 and the implementation of the mitigation measures described above would further assist in reducing any potentially significant effects occurring as a result of noise generated by construction activities.

Construction - Vibration

Typical Vibration Levels

6.6.7 Plant items likely to generate the highest levels of vibration during the construction phase would include the following:

- Piling rigs;
- Vibratory rollers and compactors;
- Material offloading onto hard surfaces; and
- Concrete vibratory plant.

6.6.8 Typical field measurements taken at sites in the UK where piling or vibratory rollers have been used (on clay-based ground, which is likely to be the highest likely generated vibration) would indicate that at a distance of around 20 metres the peak particle velocity is around 14-17 mm/s reducing to 1.5 to 2 mm/s at 30 metres distance and <1mm/s at 50 metres. For vibro piling, measured levels of vibration are shown to be between 1mm/sec and 3mm/s at a distance of between 20 to 30 metres respectively (ref: BS5228-2:2009 Table D4)

BS 5228: 2009 Part 2: Vibration

6.6.9 Part 2 of the Standard deals with vibration from construction and open sites and provides information on the effects of the levels of vibration, human and structural response, response limits of structures and practical measures to reduce vibration.

6.6.10 The distance from nearest residential receptors to any likely use of piling rigs (i.e. building foundation construction) and vibratory compaction (i.e. during road construction) could be at a distance of approximately 20 to 30 metres.

6.6.11 Based upon the published information presented above, at the closest approach to existing residential and commercial properties (i.e. 180m from the nearest boundary of the ATT plant), the likely levels of ground-borne vibration would be significantly less than the limiting value for continuous vibration of 5.0 mm/s for cosmetic damage. In addition, the levels of vibration would also be below perceptible levels of vibration (i.e. 0.3mm/s) and thus below threshold levels where cosmetic or structural damage could occur.

6.6.12 It should also be noted that, in accordance with BS5228-2:2009, best practical means would also be employed to control the levels of vibration during the construction of the development. These would include one or more of the following:

- Avoiding sensitive times of the day when piling and vibratory plant is to be used;
- Inform receptors when vibration is likely to occur and how long the vibration is likely to continue;

- Carry out vibration monitoring during periods of piling and use of vibratory
- plant when working within 50 metres of receptor boundaries;
- Use of piling rigs that produce lower vibration (i.e. auger bored piles instead of drop-hammer piling);
- Careful selection of plant to minimise vibration levels;
- Removal of ground obstructions when piling;
- Pre-boring for driven piles can reduce vibration; and
- Reduce energy input to driven piles.

6.6.13 On the basis that the nearest residential receptor is circa 180m from the boundary of the proposed development site and that best practicable means would be adopted in the construction of the facility, it is not considered that levels of vibration are likely to result in any significant effects during both general and peak vibration periods.

Operation - Vibration

6.6.14 The noise assessment carried out in support of the consented waste facility concluded (paragraph 2.8) that:
"Vibration emissions from the project during its operation would typically be below baseline levels beyond the site boundary and, therefore, are unlikely to be significant at vibration sensitive receptors outside the site boundary."

6.6.15 It is not considered that the equipment / machinery proposed as part of the proposed ATT plant development would be materially different in terms of the generation of ground borne vibration during the operation of the facility as that previously assessed. In addition, and as set out in sub-section 6.5 above, a number of measures would be incorporated within the design of the facility to ensure that the operation of the development would not give rise to any significant effects upon vibration sensitive receptors.

6.6.16 In light of the above, it is not considered that the proposed development would have the potential to give rise to any significant effects in terms of vibration. However, it is recommended that this is reassessed during the detailed design stage.

Operation - Noise

Estimated Operational Noise Emission Levels at the NSRs after the Recommended Noise Control Measures are implemented – Weekday

6.6.17 The results of the day time (07:00 to 23:00) and night time (23:00 to 07:00) operational noise emission calculations are summarised in Tables 6.12 and 6.13, respectively, after the proposed noise control measures (referenced in sub-section 6.5 above) are implemented.

6.6.18 The noise emission calculations have assumed (in line with the assessment carried out in support of the consented waste facility) that a reception building roller shutter door facing west would be fully opened. This scenario was only tested for the day time period as during the night time all doors would be kept closed and only staff access doors of the energy recovery building would momentarily be used for access. The results are provided in Table 6.14.

6.6.19 Measured background noise levels are also included in these tables. The column headed 'Difference (A-B)' presents the decibel level differences between the estimated rating noise and the measured background noise levels. This information is then used to determine the qualitative measure 'likelihood of complaints' 'sensitivity' of the NSRs considered in accordance with the guidance set out in PAN1/2011TANAN.

6.6.20 The potential noise level increase at the NSRs has also been assessed. For the purpose of this assessment the estimated specific noise levels are added to the measured residual noise levels logarithmically and the result is the estimated ambient noise level. This represents the noise level at the NSR after the development.

6.6.21 The differences between the estimated ambient noise level and the measured residual noise levels has been calculated at each NSR. The decibel differences obtained are then assessed in accordance with the guidelines given in PAN1/2011TANAN to determine the qualitative measure 'Magnitude of impact'. Results for the day time and night time assessments

are given in Tables 6.13 and 6.14, respectively. Table 6.15 presents the data when the roller shutter door facing west is fully opened.

Table 6.13: BS4142:1997 Assessment - estimated day time specific and rating noise levels and comparison of them against the measured background noise levels with all facility doors closed (Assumes all recommended noise control measures are implemented).

Day time (Weekday) – All doors are closed								
Code	**Receiver Location**	**Direction of receiver from building**	**Distance to the nearest building (m)**	**Estimated Specific Noise Level / dB(A)**	**[A] Estimated Rating Noise Level / dB(A)**	**[B] Lowest Measured Background Noise Level / dB (A)**	**Difference (A-B) / dB(A)**	**Comments**
A	30 Loan View (long term noise monitoring position)	Southwest	430	34	35	42-(1)	-7	12dB(A) less than "marginal significance"
B	Coopersknowe Crescent (nearest house)	Southwest	330	37	37	42-(1)	-5	10dB(A) less than "marginal significance"
C	Drymen No. 186 – future residential development (ref. Persimmon Homes drawing 02-01/E)	South	180	41	42	44-(2)	-2	7dB(A) less than "marginal significance"
D	Easter Langle Farmhouse	South	250	38	39	44-(2)	-5	10dB(A) less than "marginal significance"
E	Lowood Lodge (at the other side of the B6374)	South	680	30	32	42-(1)	-10	"Complaints are unlikely"
F	Cottage near the B6374	Southeast	810	28	30	44-(2)	-14	Less than "Complaints are unlikely"
G	Wester Housebyre near Davie`s Brae	Northeast	790	28	32	42-(1)	-10	"Complaints are unlikely"

(1)Lowest background noise level measured at 30 Loan View (Thursday 20/01/2011).
(2)Lowest background noise level measured at edge of site (Friday 14/01/2011 15:50).

Table 6.14: BS4142:1997 assessment - estimated night time specific and rating noise levels and comparison of them against the measured background noise levels with all facility doors closed (Assumes all recommended noise control measures are implemented)

Night time (Weekday) – All doors are closed								
Code	**Receiver Location**	**Direction of receiver from building**	**Distance to the nearest MT building / m**	**Estimated Specific Noise Level / dB(A)**	**[A] Estimated Rating Noise Level / dB(A)**	**[B] Lowest Measured Background Noise Level / dB (A)**	**Difference (A-B) / dB(A)**	**Comments**
A	30 Loan View (long term noise monitoring position)	Southwest	430	29	31	34-(2)	-3	8dB(A) less than "marginal significance"
B	Coopersknowe Crescent (nearest house)	Southwest	330	31	33	34-(2)	-1	6dB(A) less than "marginal significance"
C	Drymen No. 186 – future residential development (ref. Persimmon Homes drawing 02-01/E)	South	180	37	39	36-(1)	3	2dB(A) less than "marginal significance"
D	Easter Langlee Farmhouse	South	250	33	36	36-(1)	0	5dB(A) less than "marginal significance"
E	Lowood Lodge (at the other side of the B6374)	South	680	26	29	34-(2)	-5	10dB(A) less than "marginal significance"
F	Cottage near the B6374	Southeast	810	25	28	36-(1)	-8	13dB(A) less than "marginal significance"
G	Wester Housebyre near Davie`s Brae	Northeast	790	27	31	34-(2)	-3	8dB(A) less than "marginal significance"

(1)Based on 2dB(A) difference between noise logger and attended day time measurements. 2dB(A) added to the lowest measured night time noise level to obtain a representative background noise level for these positions.
(2)Lowest background noise level measured at 30 Loan View (Friday 21/01/2011).

Table 6.15: BS4142:1997 assessment - estimated day time specific and rating noise levels and comparison of them against the measured background noise levels with reception building shutter door open (assumes all recommended noise control measures are implemented).

Day time (Week) – A reception building roller shutter door facing west is kept fully opened.								
Code	**Receiver Location**	**Direction of receiver from building**	**Distance to the nearest building (m)**	**Estimated Specific Noise Level / dB(A)**	**[A] Estimated Rating Noise Level / dB(A)**	**[B] Lowest Measured Background Noise Level / dB (A)**	**Difference (A-B) / dB(A)**	**Comments**
A	30 Loan View (long term noise monitoring position)	Southwest	430	39	44	42-(1)	2	3dB(A) less than "marginal significance"
B	Coopersknowe Crescent (nearest house)	Southwest	330	41	47	42-(1)	5	"marginal significance"
C	Drymen No. 186 – future residential development (ref. Persimmon Homes drawing 02-01/E)	South	180	44	49	44-(2)	5	"marginal significance"
D	Easter Langle Farmhouse	South	250	41	46	44-(2)	2	3dB(A) less than "marginal significance"
E	Lowood Lodge (at the other side of the B6374)	South	680	32	37	42-(1)	-5	10dB(A) less than "marginal significance"
F	Cottage near the B6374	Southeast	810	28	33	44-(2)	-11	Less than "Complaints are unlikely"
G	Wester Housebyre near Davie`s Brae	Northeast	790	29	34	42-(1)	-8	13dB(A) less than "marginal significance"

(1)Lowest background noise level measured at 30 Loan View (Thursday 20/01/2011).
(2)Lowest background noise level measured at edge of site (Friday 14/01/2011 15:50).

Table 6.16: Magnitude of impact assessed at noise sensitive receptors during the day time period (Assumes all doors are closed)

Day (Week) – Doors closed					
Receiver	**Magnitude of Impact**	**Difference (A-B)**	**[A] Estimated Ambient Noise (B+C) / dB(A)**	**[B] Measured Residual Noise / dB(A)**	**[C] Estimated LAeq / dB(A)**
A	Negligible	0.4	44.4	44	34.1
B	Negligible	0.7	44.7	44	36.6

Table 6.17: Magnitude of impact assessed at noise sensitive receptors during the night time period (Assumes all doors are closed)

Night (Week) – Doors closed					
Receiver	**Magnitude of Impact**	**Difference (A-B)**	**[A] Estimated Ambient Noise (B+C) / dB(A)**	**[B] Measured Residual Noise / dB(A)**	**[C] Estimated LAeq / dB(A)**
A	Negligible	0.7	36.7	36	28.7
B	Minor	1.3	37.3	36	31.4
C	Minor	2.4	40.4	38	36.7
D	Minor	1.3	39.3	38	33.4
E	Negligible	0.4	36.4	36	26.3
F	Negligible	0.2	38.2	38	24.5
G	Negligible	0.5	36.5	36	27.0

Table 6.18: Magnitude of impact assessed at noise sensitive receptors during the day time period with roller shutter door open

Day (Week) – A reception roller shutter door facing west is opened.					
Receiver	**Magnitude of Impact**	**Difference (A-B)**	**[A] Estimated Ambient Noise (B+C) / dB(A)**	**[B] Measured Residual Noise / dB(A)**	**[C] Estimated LAeq / dB(A)**
A	Minor	1.1	45.1	44	38.6
B	Minor	1.9	45.9	44	41.4
C	Minor	1.8	48.8	47	44.0
D	Negligible	0.9	47.9	47	40.7
E	Negligible	0.3	44.3	44	32.0
F	Negligible	0.1	47.1	47	28.3
G	Negligible	0.1	44.1	44	28.6

6.6.22 The number of NSRs in terms of the 'likelihood of complaints' 'sensitivity' for both day time and night time are obtained based on the 'Magnitude of Impact' scale and rating noise / background noise level differences.

6.6.23 The numbers of noise sensitive receivers determined to fall within the category likelihood of complaints are shown in Tables 6.19 – 6.21.

Table 6.19: Number of noise sensitive receptors estimated when level of significance of impact against sensitivity of receptors is considered (day time – all doors are closed). After the recommended noise control measures are implemented

Day (Week) – Doors closed			
Level of significance	**Number of noise sensitive receptors in terms of likelihood of complaints sensitivity**		
	Low Δ**Lp <5dB(A)**	**Medium** **5dB(A) ≤** Δ**Lp < 10dB(A)**	**High** **10dB(A) ≤** Δ**Lp**
Large / Very large	-	-	-
Moderate / Large	-	-	-
Moderate	-	-	-
Slight / Moderate	-	-	-
Slight	-	-	-
Neutral / Slight	6 (A,B,C,D,E,G)	-	-
Neutral	1 (F)	-	-

Table 6.20: Number of noise sensitive receptors estimated when level of significance of impact against sensitivity of receptors is considered (night time – all doors are closed). After the recommended noise control measures are implemented

Night (Week) – Doors closed			
Level of significance	**Number of noise sensitive receptors in terms of likelihood of complaints sensitivity**		
	Low Δ**Lp <5dB(A)**	**Medium** **5dB(A) ≤** Δ**Lp < 10dB(A)**	**High** **10dB(A) ≤** Δ**Lp**
Large / Very large	-	-	-
Moderate / Large	-	-	-
Moderate	-	-	-
Slight / Moderate	-	-	-
Slight	-	-	-
Neutral / Slight	7 (A,B,C,D,E,F,G)	-	-
Neutral	-	-	-

Table 6.21: Number of noise sensitive receptors estimated when level of significance of impact against sensitivity of receptors is considered (day time). A reception building roller shutter door facing west is fully opened

Day (Week) – A reception building roller shutter door facing west is fully opened.			
Level of significance	**Number of noise sensitive receptors in terms of likelihood of complaints sensitivity**		
	Low Δ**Lp <5dB(A)**	**Medium** **5dB(A) ≤** Δ**Lp < 10dB(A)**	**High** **10dB(A) ≤** Δ**Lp**
Large / Very large	-	-	-
Moderate / Large	-	-	-
Moderate	-	-	-
Slight / Moderate	-	-	-
Slight	-	2 (B,C)	-
Neutral / Slight	5 (A,D,E,F,G)	-	-
Neutral	-	-	-

6.6.24 As can be seen the estimated level of significances for all but one NSR during a week day daytime period with the facility doors closed are 'Neutral / Slight' with 'Low' likelihood of complaints sensitivities. For NSR 'F' it is 'Neutral' with 'Low' likelihood of complaints sensitivity.

6.6.25 For the week day night time period it can be seen the estimated level of significances for all NSRs are 'Neutral / Slight' with 'Low' likelihood of complaints sensitivities when the doors of the proposed facility are closed.

6.6.26 When the reception building roller shutter door facing west is fully opened the estimated level of significances for NSRs 'B' and 'C' are 'Slight' with a 'Medium' likelihood of complaints sensitivities. The remaining NSRs would have an estimated level of significance of Neutral / Slight' with 'Low' likelihood of complaints sensitivities.

Estimated Operational Noise Emission Levels at the NSRs after the Recommended Noise Control Measures are implemented – Weekends

6.6.27 Estimated noise emission levels were also compared against the weekend day time and night time noise levels. The measured lowest residual and

background noise levels used for the week day assessments were compared to the measured lowest residual and background noise levels during weekends for both day time and night time periods. The results are given in Tables 6.22 and 6.23 respectively.

Table 6.22: Level difference between the lowest measured week day and weekend day time residual and background noise levels

Date at Start of Period	Daytime (0700 – 2300)			Wind Speed
	LAeq, 16h (dB)	LAF90 (dB)	Hours in dataset	
Sunday - 23/01/2011	40	37	16	< 5m/s
Thursday - 20/01/2011	44	42	15	< 5m/s
Difference	-4	-5	-	-

6.6.28 As can be seen the lowest measured background noise level during a weekend is 5dB(A) lower than the lowest measured background noise level during a week day. Similarly, the lowest measured residual noise level during a weekend is 4dB(A) lower than the lowest measured residual noise level during a week day. Sunday noise levels are used when the scenario with all doors closed was tested for day time (see Table 6.13 above).

6.6.29 It is understood that there will be no deliveries on Sundays, therefore, when the scenario with a door open was tested Saturday day time noise levels were used as these were considered to be more representative. Measured Saturday day time noise levels are compared against the week day time noise levels used during the week day noise emission assessment.

Table 6.23: Level difference between the lowest measured week day and Saturday day time residual and background noise levels. Used to estimate levels with a roller shutter door is open

Date at Start of Period	Daytime (0700 – 2300)			Wind Speed
	LAeq, 16h (dB)	LAF90 (dB)	Hours in dataset	
Saturday - 22/01/2011	43	39	16	< 5m/s
Thursday - 20/01/2011	44	42	15	< 5m/s
Difference	*-1*	*-3*	-	-

6.6.30 Similarly, measured environmental noise levels during night time on a weekend are lower than the measured noise levels on a week day. However, in this case the level differences are 1dB(A) both for the residual and background noise levels (see table 6.23 below).

Table 6.24: Level difference between the lowest measured week day and weekend night time residual and background noise levels. Used to estimate levels with doors closed

Date at Start of Period	Night time (2300 – 0700)			Wind Speed
	LAeq, 16h (dB)	LAF90 (dB)	Hours in dataset	
Saturday - 22/01/2011	35	33	8	< 5m/s
Thursday - 20/01/2011	36	34	8	< 5m/s
Difference	*-1*	*-1*	-	-

6.6.31 The results of the weekend day time (07:00 to 23:00) and night time (23:00 to 07:00) operational noise emission calculations are summarised in Tables 6.25 and 6.26 respectively.

6.6.32 The noise emission calculation results for the weekend day time with a reception building roller shutter door facing west fully opened are given in Table 6.27.

Table 6.25: BS4142:1997 assessment - estimated weekend day time specific and rating noise levels and comparison of them against the measured background noise levels. (Assumes all doors are closed)

Day time (Weekend) – All doors are closed								
Code	**Receiver Location**	**Direction of receiver from building**	**Distance to the nearest building (m)**	**Estimated Specific Noise Level / dB(A)**	**[A] Estimated Rating Noise Level / dB(A)**	**[B] Lowest Measured Background Noise Level / dB (A)**	**Difference (A-B) / dB(A)**	**Comments**
A	30 Loan View (long term noise monitoring position)	Southwest	430	34	35	37-(1)	-2	7dB(A) less than "marginal significance"
B	Coopersknowe Crescent (nearest house)	Southwest	330	37	37	37-(1)	0	5dB(A) less than "marginal significance"
C	Drymen No. 186 – future residential development (ref. Persimmon Homes drawing 02-01/E)	South	180	41	42	39-(2)	3	2dB(A) less than "marginal significance"
D	Easter Langle Farmhouse	South	250	38	39	39-(2)	0	5dB(A) less than "marginal significance"
E	Lowood Lodge (at the other side of the B6374)	South	680	30	32	37-(1)	-5	10dB(A) less than "marginal significance"
F	Cottage near the B6374	Southeast	810	28	30	39-(2)	-9	14dB(A) less than "marginal significance"
G	Wester Housebyre near Davie`s Brae	Northeast	790	28	32	37-(1)	-5	10dB(A) less than "marginal significance"

(1)Lowest background noise level measured at 30 Loan View (Sunday 23/01/2011).
(2)Assumed figure based on the level difference for day time period between the noise level measured at 30 Loan View and by the south edge of the site.

Table 6.26: BS4142: 1997 assessment - estimated weekend night time specific and rating noise levels and comparison of them against the measured background noise levels. (Assumes all doors are closed)

Night time (Weekend) – All doors are closed								
Code	**Receiver Location**	**Direction of receiver from building**	**Distance to the nearest building (m)**	**Estimated Specific Noise Level / dB(A)**	**[A] Estimated Rating Noise Level / dB(A)**	**[B] Lowest Measured Background Noise Level / dB (A)**	**Difference (A-B) / dB(A)**	**Comments**
A	30 Loan View (long term noise monitoring position)	Southwest	430	29	31	33-(1)	-2	7dB(A) less than "marginal significance"
B	Coopersknowe Crescent (nearest house)	Southwest	330	31	33	33-(1)	0	5dB(A) less than "marginal significance"
C	Drymen No. 186 – future residential development (ref. Persimmon Homes drawing 02-01/E)	South	180	37	39	35-(2)	4	1dB(A) less than "marginal significance"
D	Easter Langle Farmhouse	South	250	33	36	35-(2)	1	4dB(A) less than "marginal significance"
E	Lowood Lodge (at the other side of the B6374)	South	680	26	29	33-(1)	-4	9dB(A) less than "marginal significance"
F	Cottage near the B6374	Southeast	810	25	28	35-(2)	-7	12dB(A) less than "marginal significance"
G	Wester Housebyre near Davie`s Brae	Northeast	790	27	31	33-(1)	-2	7dB(A) less than "marginal significance"

(1)Lowest background noise level measured at 30 Loan View (Saturday 22/01/2011).
(2)Assumed figure based on the level difference for day time period between the noise level measured at 30 Loan View and by the south edge of the site.

Table 6.27: BS4142:1997 assessment - estimated weekend day time specific and rating noise levels and comparison of them against the measured background noise levels. (Assumes a reception building roller shutter door facing west is fully opened)

Day time (Weekend) – A reception building roller shutter door facing west is kept fully opened.								
Code	**Receiver Location**	**Direction of receiver from building**	**Distance to the nearest building (m)**	**Estimated Specific Noise Level / dB(A)**	**[A] Estimated Rating Noise Level / dB(A)**	**[B] Lowest Measured Background Noise Level / dB (A)**	**Difference (A-B) / dB(A)**	**Comments**
A	30 Loan View (long term noise monitoring position)	Southwest	430	39	44	39-(1)	5	"marginal significance"
B	Coopersknowe Crescent (nearest house)	Southwest	330	41	47	39-(1)	8	3dB(A) above "marginal significance"
C	Drymen No. 186 – future residential development (ref. Persimmon Homes drawing 02-01/E)	South	180	44	49	41-(2)	8	3dB(A) above "marginal significance"
D	Easter Langle Farmhouse	South	250	41	46	41-(2)	5	"marginal significance"
E	Lowood Lodge (at the other side of the B6374)	South	680	32	37	39-(1)	-2	7dB(A) less than "marginal significance"
F	Cottage near the B6374	Southeast	810	28	33	41-(2)	-8	13dB(A) less than "marginal significance"
G	Wester Housebyre near Davie`s Brae	Northeast	790	29	34	39-(1)	-5	10dB(A) less than "marginal significance"

(1)Lowest background noise level measured at 30 Loan View (Saturday 22/01/2011).
(2)Assumed figure based on the level difference for day time period between the noise level measured at 30 Loan View and by the south edge of the site.

6.6.33 'Magnitude of Impact' for the weekend are presented in Tables 6.28 – 6.31 for day time, night time and day time with a roller shutter door open, respectively.

Table 6.28: Magnitude of impact at assessed noise sensitive receptors during weekend day time. All doors are closed.

Day (Weekend) – Doors closed					
Receiver	**Magnitude of Impact**	**Difference (A-B)**	**[A] Estimated Ambient Noise (B+C) / dB(A)**	**[B] Measured Residual Noise / dB(A)**	**[C] Estimated LAeq / dB(A)**
A	Minor	1	41	40	34.1
B	Minor	1.6	41.6	40	36.6
C	Minor	2.7	44.7	42	41.3
D	Minor	1.5	43.5	42	38.0
E	Negligible	0.4	40.4	40	30.1
F	Negligible	0.2	42.2	42	27.5
G	Negligible	0.3	40.3	40	28.4

Table 6.29: Magnitude of impact at assessed noise sensitive receptors during weekend night time. All doors are closed.

Night (Weekend) – Doors closed					
Receiver	**Magnitude of Impact**	**Difference (A-B)**	**[A] Estimated Ambient Noise (B+C) / dB(A)**	**[B] Measured Residual Noise / dB(A)**	**[C] Estimated LAeq / dB(A)**
A	Negligible	0.9	35.9	35	28.7
B	Minor	1.6	36.6	35	31.4
C	Minor	2.9	39.9	37	36.7
D	Minor	1.6	38.6	37	33.4
E	Negligible	0.5	35.5	35	26.3
F	Negligible	0.2	37.2	37	24.5
G	Negligible	0.6	35.6	35	27.0

Table 6.30: Magnitude of impact at assessed noise sensitive receptors during weekend day time. After the recommended noise control measures are implemented and a reception building roller shutter door facing west is open.

Day (Weekend) – A reception building roller shutter door facing west is fully opened.					
Receiver	**Magnitude of Impact**	**Difference (A-B)**	**[A] Estimated Ambient Noise (B+C) / dB(A)**	**[B] Measured Residual Noise / dB(A)**	**[C] Estimated LAeq / dB(A)**
A	Minor	1.3	44.3	43	38.6
B	Minor	2.3	45.3	43	41.4
C	Minor	2.5	47.5	45	44.0
D	Minor	1.4	46.4	45	40.7
E	Negligible	0.3	43.3	43	32.0
F	Negligible	0.1	45.1	45	28.3
G	Negligible	0.2	43.2	43	28.6

6.6.34 In Tables 6.31 – 6.33 numbers of noise sensitive receivers are determined in terms of the likelihood of complaints sensitivity and the rating noise and background noise differences obtained.

Table 6.31: Number of noise sensitive receptors estimated when level of significance of impact against sensitivity of receptors is considered (Weekend day time – All doors closed)

Day (Weekend) - Doors closed			
Level of significance	**Number of noise sensitive receptors in terms of likelihood of complaints sensitivity**		
	Low Δ**Lp <5dB(A)**	**Medium** **5dB(A) ≤** Δ**Lp < 10dB(A)**	**High** **10dB(A) ≤** Δ**Lp**
Large / Very large	-	-	-
Moderate / Large	-	-	-
Moderate	-	-	-
Slight / Moderate	-	-	-
Slight	-	-	-
Neutral / Slight	7 (A, B,C, D, E, F, G)	-	-
Neutral	-	-	-

(1)Actual numbers of noise sensitive receptors might be more than the numbers shown as the numbers given are only for the sample NSRs considered here. Capital letters given inside brackets indicate specific assessment locations

(2) ΔL = rating noise (L_{Ar-Tr}) – background noise ($L_{AF90,T}$)

Table 6.32: Number of noise sensitive receptors estimated in terms of when level of significance of impact against sensitivity of receptors is considered (Weekend night time – All doors closed)

Night (Weekend) - Doors closed			
Level of significance	**Number of noise sensitive receptors in terms of likelihood of complaints sensitivity**		
	Low $\Delta Lp^{(}$ **<5dB(A)**	**Medium** **5dB(A) ≤ ΔLp < 10dB(A)**	**High** **10dB(A) ≤ ΔLp**
Large / Very large	-	-	-
Moderate / Large	-	-	-
Moderate	-	-	-
Slight / Moderate	-	-	-
Slight	-	-	-
Neutral / Slight	7 (A, B,C,D, E, F, G)	-	-
Neutral	-	-	-

(1) Actual numbers of noise sensitive receptors might be more than the numbers shown as the numbers given are only for the sample NSRs considered here. Capital letters given inside brackets indicate specific assessment locations
(2) ΔL = rating noise ($L_{Ar\text{-}Tr}$) – background noise ($L_{AF90,T}$)

Table 6.33: Number of noise sensitive receptors estimated in terms of when level of significance of impact against sensitivity of receptors is considered (Weekend day time). A reception building roller shutter door facing west is fully opened.

Day (Weekend) - A reception building roller shutter door facing west is fully opened and the recommended noise control measures are implemented.			
Level of significance	**Number of noise sensitive receptors in terms of likelihood of complaints sensitivity**		
	Low **ΔLp <5dB(A)**	**Medium** **5dB(A) ≤ ΔLp < 10dB(A)**	**High** **10dB(A) ≤ ΔLp**
Large / Very large	-	-	-
Moderate / Large	-	-	-
Moderate	-	-	-
Slight / Moderate	-	-	-
Slight	-	4 (A, B, C, D)	-
Neutral / Slight	3 (E, F, G)	-	-
Neutral	-	-	-

(1) Actual numbers of noise sensitive receptors might be more than the numbers shown as the numbers given are only for the sample NSRs considered here. Capital letters given inside brackets indicate specific assessment locations
(2) ΔL = rating noise (LAr-Tr) – background noise (LAF90,T)

6.6.35 As can be seen the estimated level of significances are 'Neutral / Slight' with 'Low' likelihood of complaints sensitivities. These are similar to the findings when a week day was assessed. The weekend day time assessment when all doors of the proposed facility are assumed to be closed is based on the noise levels measured on a Sunday while the night time assessment is based on the noise levels measured on a Saturday.

6.6.36 It is also found that if a reception building roller shutter door facing west was fully opened then there would be four NSRs that would be assessed as having 'Slight' level of significance with 'Medium' likelihood of complaints sensitivities. This is two more NRRs within this category of significance than the week day assessment.

Comparison of the Estimated Sound Spectra with the Noise Rating Curves Specified within SBC's Standard Noise Condition

6.6.37 As noted in sub-section 6.2 the EHO at SBC has suggested that their standard noise condition should be applied to any planning permission for the proposed development.

6.6.38 This sub-section specifically considers whether the operation of the proposed development would comply with the requirements of the condition should it be applied to any future planning consent for the ATT plant development.

6.6.39 The assessment compares the estimated sound spectra inside a room (with a slightly opened window) against the suggested daytime and night-time noise rating curves in the wording of the condition. It is assumed for the purposes of carrying out the assessment that the window would be opened by 0.1m in relation to the window frame.

6.6.40 Estimated sound break in spectra based on the estimated rating noise levels were also used in the assessment. Therefore, they include a +5dB(A) acoustic feature characteristic correction. However, a noise source having a tonal characteristic will usually have noticeably higher sound energy in a single octave band (or about a few octave bands if there are multiple tones or a strong tone occurs near the skirts of the two adjacent octave bands). For

example, a line transformer with tonal components at 100Hz and 200Hz would have more sound energy at 125Hz and 250Hz octave bands compared to the other octave bands. Therefore, the following assessment is considered to represent a worst case scenario.

6.6.41 Normally, a 3dB change in sound level is just noticeable by a young person with a healthy hearing mechanism outside of the controlled laboratory environment. For a human having a healthy hearing mechanism to register a sensation of halving or doubling of the sound level a 10dB difference in the sound pressure level is required. Therefore, usually a difference of 3dB or less is considered not to represent a significant change in the sound level perceived.

6.6.42 Thus, any exceedance at a single octave band over the corresponding noise rating (NR) curve is considered to be marginal if the exceedance is equal to or less than 3dB, provided that most of the assessed noise curve lies below the relevant NR curve.

Day Time Noise Break In (All doors of the proposed facility are closed)

6.6.43 The estimated A-weighted broadband break in noise level is about 32dB(A) and the corresponding free field noise level is about 43dB(A). Therefore, the estimated room external facade outside to inside sound insulation performance is about 11dB. This is in line with the guidance given in WHO1999[7] and BS8233: 1999[8].

6.6.44 The LA's proposed day time noise break in criterion is NR30. This equates to an A-weighted broadband sound level of about 39dB(A) [63Hz to 8kHz].

6.6.45 The estimated day time noise break in spectrum is compared against NR30 (at 63Hz to 8kHz octave band centre frequencies) and the results are given in Table 6.34 over the page.

[7] World Health Organisation, "Guidelines for Community Noise", 1999.
[8] BS8233, "Sound insulation and noise reduction for buildings – Code of practice",1999.

Table 6.34: Comparison of the estimated day time noise break in spectrum with the LA's room internal noise criterion NR30. It is assumed that room facade window would slightly be opened at Receiver C. (Assumes all doors of the proposed facility are closed).

After noise control measures (for engines and certain parts of the ATT building) are implemented. The nearest receiver distance is ~ 180m.								
Octave band centre frequency	**63Hz**	**125Hz**	**250Hz**	**500Hz**	**1kHz**	**2kHz**	**4kHz**	**8kHz**
Exceedance in dB	0	0	0	0	0	0	0	0

Night Time Noise Break In (All doors of the proposed facility are closed)

6.6.46 The estimated A-weighted broadband noise level is about 30dB(A) and the corresponding free field noise level is about 40dB(A). In this instance the estimated room external facade outside to inside sound insulation performance is about 10dB. This is also in line with the guidance given in WHO1999[6] and BS8233: 1999[7].

6.6.47 The LA's proposed night time room noise break in criterion is NR20 that equates to A-weighted broadband sound level of about 30dB(A) [63Hz to 8kHz].

6.6.48 The estimated night time noise break in spectrum is compared against NR20 (at 63Hz to 8kHz octave band centre frequencies).

Table 6.35: Comparison of the estimated night time noise break in spectrum with the LA's room internal noise criterion NR20. It is assumed that room facade window would slightly be opened at receiver C. (Assumes all doors of the proposed facility are closed)

Octave band centre frequency	**63Hz**	**125Hz**	**250Hz**	**500Hz**	**1kHz**	**2kHz**	**4kHz**	**8kHz**
Exceedance in dB	0	2	0	0	0	0	0	0
Dominant noise sources (most significant to less significant)	-	Engine exhaust Transformers	-	-	-	-	-	-

Day Time Noise Break In (A reception building roller shutter door facing west is opened)

6.6.49 The estimated A-weighted broadband break in noise level is about 38dB(A) and the corresponding free field noise level is about 49dB(A) corresponding to about 11dB outside to inside facade sound insulation performance.

6.6.50 The estimated day time noise break in spectrum with a reception building roller shutter door facing west fully opened is compared against NR30 (at 63Hz to 8kHz octave band centre frequencies) and the results are given in Table 6.36.

Table 6.36: Comparison of the estimated day time noise break in spectrum with the LA's room internal noise criterion NR30. It is assumed that room facade window would slightly be opened at receiver C. (Assumes a reception building roller shutter door facing west is fully opened)

Octave band centre frequency	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz
Exceedance in dB	0	0	0	0	2	0	1	0
Dominant noise source	-	-	-	-	1. Reception building west facade	-	1. Reception building west facade	-

6.6.51 It is clear from the information provided within Tables 6.34 - 6.36 that, with the proposed mitigation measures in place, the operation of the ATT plant would not result in any exceedence of a single octave band over the corresponding NR curve of greater than 2dB and in most cases the assessed noise levels would be below relevant NR curve. As a consequence, the exceedeneces can be considered marginal and thus the operation of the facility should be possible in the context of the suggested planning condition.

Significance of Estimated Operational Noise Levels

6.6.52 Following the guidance given in Planning Advice Note (PAN) 1/2011 Technical Advice Note Assessment of Noise (TANAN) and BS4142:1997 quantitative and qualitative noise assessments have been carried out in connection with the operation of the proposed ATT plant development.

6.6.53 Noise emissions from the proposed ATT plant have been assessed on the assumption that all proposed mitigation measures are in place and have been considered in the context of the following scenarios:

Daytime

- Noise emissions with a reception roller shutter door facing west open.
- Noise emissions without a reception roller shutter door facing west open.

Night-time

- Noise emissions without a reception roller shutter door facing west open.

6.6.54 No night time assessment has been carried out with a roller shutter door open on the basis that all doors would be shut during this period.

6.6.55 The potential effects of the proposed development based upon the aforementioned scenarios have been assessed in the context of the impact significance ratings set out within PAN/2011TANAN (see Table 6.2 for further details).

6.6.56 PAN/2011TANAN provides (at paragraph 3.29) the following guidance regarding the level of significance of a noise impact on a property, it states:

Table 6.37 PAN/2011TANAN Impact Significance Criterion

Impact Significance	Commentary
Very Large	These effects represent key factors in the decision-making process. They are generally, but not exclusively associated with impacts where mitigation is not practical or would be ineffective.
Large	These effects are likely to be important considerations but where mitigation may be effectively employed such that resultant adverse effects are likely to have a Moderate or Slight significance.
Moderate	These effects, if adverse, while important, are not likely to be key decision making issues.
Slight	These effects may be raised but are unlikely to be of importance in the decision making process.
Neutral	No effect, not significant, noise need not be considered as a determining factor in the decision making process.”

All Doors Closed

6.6.57 With the recommended noise control measures fully implemented and all doors of the proposed facility closed, the week day and weekend day time 'Level of significance' for all NSRs except NSR 'F' would be assigned 'Neutral / Slight' 'Level of significance' with 'Low' likelihood of complaints sensitivity. NSR 'F' would be assigned 'Neutral / Slight' 'Level of significance' only during the weekend day time while it would be assigned 'Neutral' 'Level of significance' during the week day, day time and it would have 'Low' likelihood of complaints sensitivity on both occasions.

6.6.58 When the week day and weekend night time periods were assessed it was found that all NSRs would be assigned 'Neutral / Slight' 'Level of significance' with 'Low' likelihood of complaints sensitivities provided that the recommended noise control measures are fully implemented and all doors of the proposed facility are kept closed.

Doors Facing West Open

6.6.59 With a reception building roller shutter door facing west fully opened, the week day, day time 'Level of significance' for NSRs 'B' and 'C' would be 'Neutral / Slight' with 'Medium' likelihood of complaints sensitivity. While the remaining NSRs would still be assigned 'Neutral / Slight' 'Level of significance' with 'Low' likelihood of complaints sensitivities.

6.6.60 When the weekend day time is considered, with a reception building roller shutter door facing west fully opened, NSRs 'A, B, C and D' would be assigned 'Slight' 'Level of significance' with 'Medium' likelihood of complaints sensitivities while the remaining NSRs would still be assigned 'Neutral / Slight' 'Level of significance' with 'Low' likelihood of complaints sensitivities.

6.6.61 It is clear from the conclusions of the noise assessment outlined above that the level of significance of the noise impact on the nearest NSRs would not be any greater than 'Neutral / Slight' or 'Slight' in all cases when the proposed mitigation measures have been implemented. As set out in Table 6.36 above if the level of significance is assessed as slight they are *"unlikely*

to be of importance in the decision making process". Accordingly, it can be concluded that the potential noise impact of the proposed development would not be significant in EIA terms.

6.6.62 In addition to the assessment against the requirements of PAN2011 TANAN a separate assessment has also been carried out which considers whether the operation of the proposed ATT plant would accord with the requirements of SBCs standard planning condition in relation to noise. The assessment has confirmed that the operation of the facility should be possible in the context of the suggested planning condition with only marginal exceedences of the ratings in a limited number of band frequencies anticipated.

6.7 Conclusions

Construction

6.7.1 The matter of construction noise was assessed in the noise assessment associated with the consented waste facility at the site. This confirmed that the noise associated with the construction of the facility is unlikely to be significant due to the separation distance between the site and the nearest noise sensitive receptors. It also concluded that, effects during the construction phase would generally only occur during the daytime and would be temporary in duration.

6.7.2 It is not considered that the construction methods that would be adopted in connection with the proposed ATT plant development would be materially different to those associated with the consented waste facility and as such these conclusions (i.e. no significant environmental effects are predicted) should also apply to the proposed development.

6.7.3 Moreover, and in accordance with BS5228, it is also important to note that best practical means would be employed to control the generation of noise during the construction phase which would further assist in preventing any potentially significant effects from occurring as a result of construction activities.

Operation

6.7.4 The assessment has established that the main sources of noise from the proposed ATT plant development would be:

- Noise generated by the 23m high exhaust; and
- Noise break-out from the south, east and west facades of the fuel preparation facility and the buildings associated with the ATT plant.

6.7.5 A number of noise control measures are proposed in order to address these issues which include the use of gas engine exhaust silencers, acoustic plenum and acoustic insulation within the proposed building fabric.

6.7.6 With the recommended noise control measures implemented, it has been found that the level of significance of the noise impact on the nearest NSRs would not be any greater than 'Neutral / Slight' or 'Slight' when assessed in terms of the guidance set out within PAN/2011 TANAN. A 'Slight' level of significance is considered in PAN/2011 to be *"unlikely to be of importance in the decision making process".* In light of this, it can be concluded that the potential noise impact of the proposed development would be acceptable at the nearest NSRs and would not be significant in EIA terms.

Vibration

6.7.7 In terms of ground-borne vibration, it has been assessed that a combination of the distance between the works and receptors (circa 180m to the nearest receptor) and the adoption of best practicable measures, should ensure that no significant effects would occur as a result of vibration during the construction phase.

6.7.8 Based on the findings of the noise assessment carried out in support of the consented waste facility, operational vibration is considered to be negligible at this stage. However, it is recommended that this is reassessed during the detailed design stage to ensure that the normal operations of the proposed new development would not cause any adverse impacts on vibration sensitive receivers.

7.0 AIR QUALITY

7.1 Introduction

7.1.1 This chapter of the ES describes the air quality assessment that has been undertaken for the proposed development of an ATT plant at Easter Langlee, Galashiels.

7.1.2 The proposed ATT plant and fuel preparation facility would replace elements of a consented waste facility at the site which was the subject of an air quality assessment, carried out by RPS in February 2011 that assessed oxides of nitrogen, ammonia and odour emissions from the biofilter ventilation exhaust[9]. The previous Air Quality Assessment has been referenced in the preparation of this ES chapter.

7.1.3 As a regulated process under the Pollution Prevention and Control (PPC) (Scotland) Regulations, the ATT plant will require a permit from the Scottish Environment Protection Agency (SEPA) in order to operate. This is the subject of a separate application and assessment process and SEPA will only issue a permit if they are satisfied that the proposed facility will adhere to strict emission limits for discharges to the atmosphere. Thereafter, the operator will be required to monitor discharges to the atmosphere and submit records to SEPA demonstrating compliance. The Permit is expected to incorporate emission limits for all substances controlled under the stringent European Waste Incineration Directive (WID, now incorporated in the Industrial Emissions Directive (IED)[10]), for the pyrolysis / gasification processes and landfill gas engine limits for the CHP engine exhausts.

7.1.4 The ATT plant would employ proven technology involving pyrolysis and gasification of a pre-prepared waste feedstock, rather than the direct combustion of a mixed waste stream. A process description is provided in Chapter 3.0 of this ES. The main emissions to air from the ATT plant would be the engine exhaust gases and a lesser quantity of exhaust gas from the gasification process, which are discharged via a single multiple flue exhaust.

[9] Easter Langlee, Mechanical Biological Treatment Facility, Air Quality Assessment, RPS Planning and Development Ltd. February 2011

[10] OJ L334/68 Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control

The main pollutant emissions would be oxides of nitrogen, which are the focus of this assessment. The anticipated minor emissions of other regulated pollutants, including trace elements such as heavy metals, will be addressed in the assessment undertaken for the PPC permit application.

7.1.5 To determine the effects of the operational ATT plant emissions on local air quality for planning purposes, an atmospheric dispersion model has been used. The modelled short-term and long-term ground level concentrations are evaluated in the context of the regulatory air quality criteria for human health and ecological sites, taking into account, as appropriate, the existing background ambient air quality.

7.1.6 The assessment of the ATT plant presented herein evaluates the stand-alone oxides of nitrogen emissions from the exhaust discharge and also addresses the cumulative effect of the emissions of oxides of nitrogen from the biofilter connected to the fuel preparation facility.

7.1.7 It is understood that there would be no emissions of ammonia from the ATT plant, and that there should be a reduction in residual odour, ammonia and oxides of nitrogen emissions from the biofilter exhaust as a result of the revisions to the processes carried out within the fuel preparation facility. This is because the biostabilisation process will be replaced with mechanical drying resulting in a lower volume of air and reduced odour input requiring treatment in the biofilter. However, for the purposes of the current assessment, it is assumed that there would be no change, and hence the values as presented in the RPS report on emissions from the consented waste facility provide a conservative assessment.

7.1.8 The potential for emissions from construction activities is limited, as the buildings proposed as part of the ATT plant are similar in terms of their scale and massing to those proposed in connection with the consented waste facility, and no substantial new structures are required.

7.1.9 In summary, the assessment presented in this chapter comprises:

- A qualitative assessment of the effects of construction activities, including dust and transport emissions;
- A qualitative assessment of odour emissions from the biofilter;

- A detailed assessment of oxides of nitrogen emissions from the ATT exhaust for both human health and ecological receptors;
- A detailed assessment of nitrogen deposition from the ATT exhaust for ecological receptors;
- A cumulative assessment of oxides of nitrogen emissions from the biofilter and ATT exhausts for both human health and ecological receptors; and
- A cumulative assessment of nitrogen deposition from the biofilter and ATT exhausts for ecological receptors.

7.1.10 The air quality chapter is set out as follows:

- The Regulatory, Planning and Policy Context section describes the local air pollutants, the relevant air quality criteria and the relevant planning guidance in the context of the local authority's role in air quality management;
- The Assessment Methodology section presents the approach adopted and includes a process description. The methodology used for the dispersion modelling is presented, including the treatment of meteorological data, receptor grids, buildings and proposed ATT plant emissions data;
- The Baseline Conditions section evaluates existing ambient air quality as documented in local authority and national monitoring network reports, and provides background pollutant concentrations. Local meteorological data used in the assessment is also described and nearby receptors identified;
- Assessment of Effects on Air Quality presents the qualitative assessment findings for construction dust, transport and odour emissions, and an evaluation of the results of the air dispersion modelling, including an assessment of cumulative effects with the consented waste facility; and
- The Conclusions section summarises the findings of the assessment process.

7.2 Regulatory, Planning and Policy Context

Air Quality Criteria

7.2.1 In most urban areas in the UK, sources of local air pollutants will generally include road and public transport, building heating systems and industrial processes. Of these sources, road transport tends to dominate. In recent years, the local air pollutants causing most concern have tended to be nitrogen dioxide and particulates. In terms of effects on sensitive ecological habitats, oxides of nitrogen and sulphur dioxide are of concern.

Human Health

7.2.2 The Government's Air Quality Strategy (AQS) for England, Scotland, Wales and Northern Ireland provides details of national air quality standards and objectives for a number of local air pollutants including nitrogen dioxide. These criteria are Air Quality Standards (Scotland) \Regulations 2010 SSI 2010/204. These regulations implement the EU Directive 2008/50/EC on ambient air quality and cleaner air for Europe (the Air Quality Directive).

7.2.3 The air quality standards define the level of pollution below which health effects are unlikely to be experienced even by the most sensitive members of the population. These are based upon recommendations of the Expert Panel on Air Quality Standards (EPAQS). The air quality objectives are targets for air pollution concentrations which take account of the costs and benefits of achieving the standard. In the case of short-term targets, the permissible number of hours or days above the objective concentration is also specified. The number of permissible 'exceedences' is considered when determining compliance with the short-term objectives over an annual period. Local authorities are not legally obliged to achieve the air quality objectives. They are, however, required to work towards the objectives by drawing up action plans setting out the measures they intend to take in pursuit of them.

7.2.4 It should be noted that the air quality criteria only apply in locations where there may be a 'relevant exposure'. These human health objectives are applicable where members of the public may be exposed to pollutant levels

for periods equal to or exceeding the averaging periods set for these criteria. Locations of relevant exposure include building facades of residential premises, schools, public buildings and medical facilities; places of work (other than certain community facilities) are excluded.

7.2.5 The relevant air quality criteria for the protection of human health for nitrogen dioxide are presented in Table 7.1.

Table 7.1: Air Quality Strategy Objectives for Nitrogen Dioxide

Pollutant	Objective
Nitrogen dioxide, NO_2	Hourly average concentration should not exceed 200 µg/m^3 more than 18 times a year Annual mean concentration should not exceed 40 µg/m^3

Vegetation and Ecosystems

7.2.6 The European Union has set limit values for nitrogen oxides (NO_x) for the protection of vegetation based on the work of the United Nations Economic Commission for Europe (UNECE) and World Health Organisation (WHO); these limit values have been incorporated into the regulations in SSI 2010/204. The limit value for NOx for the protection of vegetation is 30 µg/m^3, expressed as an annual mean.

7.2.7 Assessment of compliance with the limit values for the protection of vegetation is undertaken at locations more than 20 kilometres from towns with more than 250,000 inhabitants or more than five kilometres from other built-up areas, industrial installations or motorways. The AQS objectives do not apply in these areas where assessment of compliance with the limit value is not required; however, as the UNECE and the WHO have set a critical level for NOx for the protection of vegetation, the Statutory Nature Conservation Agencies' (in Scotland, Scottish Natural Heritage) policy is to apply the 30 µg/m^3 criterion as a benchmark, on a precautionary basis, in internationally designated conservation sites and Sites of Special Scientific Interest (SSSI).

7.2.8 In addition, critical loads for nitrogen and acid deposition have been set by the UNECE, that represent (according to current knowledge) the exposure

below which there should be no significant harmful effects on sensitive elements of the ecosystem. The critical loads vary by type of ecosystem. Ranges for critical loads rather than fixed values are used to allow for natural variation, uncertainties about effects of deposition and temporal variability of available data.

Dust and Odour

7.2.9 There are no statutory quantitative controls or limits on general dust emissions from construction sites. Dust levels that are substantially elevated above the norm can cause annoyance. This commonly relates to increased rates of dust deposition on exposed surfaces and / or soiling (discolouration / contamination), although less commonly the term may relate to levels that are 'prejudicial to health', including airborne dust. Such emissions are however included in Statutory Nuisance provisions under the Environmental Protection Act 1990. Detection of and requiring action to stop any Statutory Nuisance are responsibilities of the local authority.

7.2.10 Odour arises from the properties of certain substances in the air that stimulate the olfactory receptors in the nose to give the sensation of smell, the odour thus perceived often being due to a complex mixture of a large number of substances. Odours may be described as pleasant or unpleasant. The latter category covers a range of varying degrees of offensiveness. Odour may cause a perceived loss of amenity or annoyance. If an unpleasant odour is sufficiently strong and regularly noticeable it may be regarded as a nuisance; however a nominally pleasant odour may also be regarded as a nuisance if frequently evident at a sufficiently high concentration. Unpleasant odour is generally associated with the decay of organic materials (e.g. vegetable matter).

Planning and Air Quality Management

7.2.11 The Scottish Government's planning guidance of general relevance for air quality is found within the National Planning Framework for Scotland (NPF2). This states that: *"The Scottish Government is committed to improving air quality and is giving particular priority to addressing problems in designated*

Air Quality Management Areas (AQMAs). Where a proposed development could have significant impacts on air quality, close co-operation between planning authorities and those with responsibility for air quality and pollution control will be essential."

7.2.12 NPF2 is supported by an Action Programme for implementation of the NPF strategy. Action 44 is specific to the improvement of air quality (Action 44). It includes the adoption of the Highland-wide Local Development Plan in April 2012 that contains a new comprehensive policy approach to air quality.

Regulatory Control

7.2.13 The proposed ATT plant comprises a listed activity under Schedule 1 of the Pollution Prevention and Control (Scotland) Regulations 2012. The current regulations, as were their predecessors in 2000 and 2007, are made under the Pollution Prevention and Control Act 1999. Pollutant emission concentrations from the pyrolysis and gasification element of the ATT plant will be required to meet the stringent limits specified in the Waste Incineration Directive (2000/76/EC) (WID), which have recently been incorporated in the Industrial Emissions Directive (2010/75/EU) (IED). For clarity, this report refers to the regulatory criteria as the WID limits as this term is considered to be more familiar.

7.2.14 The proposed facility will operate within the conditions specified by the SEPA in its authorisation of the operation, subject to the operator's permit application having satisfactorily demonstrated the use of best available technology (BAT) to protect the environment. The permit conditions will include inter alia limits to the concentrations of the potential emissions from the plant. As the ATT process falls within the scope of the WID, the permit is likely to reflect the stringent European emission limits as a minimum standard for atmospheric discharges. A full assessment against all the pollutants contained within the WID will be addressed as part of the PPC Permit application for this facility.

7.2.15 In addition to meeting the requirements of BAT, the SEPA in its regulatory role, will have regard to numerous other national and international standards

and obligations, which must either be safeguarded through the PPC permit or, at least taken into account in setting permit conditions.

7.2.16 The emission limits for the spark ignition gas engines are expected to reflect the standards for landfill gas engines set out in SEPA technical guidance[11].

7.2.17 SEPA provides guidance on air quality criteria for use in air quality assessments in the Horizontal Guidance Note H1[12]. This gives long-term and short-term Environmental Assessment Levels (EALs) for numerous substances, many of which do not have statutory criteria. These environmental benchmarks are an indicator of the concentration that can be considered to be acceptable for a particular substance. The EALs use the national AQS objectives where available and supplements these with values derived from Health and Safety Executive Occupational Exposure Limits. The EALs are non-statutory and hence published statutory air quality criteria, such as those included in the AQS, are used in preference where they exist.

Local Air Quality Management

7.2.18 Under Part IV of the Environment Act 1995 all local authorities are responsible for Local Air Quality Management (LAQM), the mechanism by which the Government's air quality objectives are to be achieved. As part of this LAQM role, local authorities are required to periodically review air quality in their area and to assess the present and likely future air quality against the objectives defined in Regulations. Where a local authority anticipates an objective is expected to be breached within their district, they must designate an AQMA and develop an action plan to improve pollution levels. Under the LAQM regime, a local authority is responsible for regular review and assessment of local air quality, reports on which are published following public consultation and review by the Department for Environment, Food and Rural Affairs (DEFRA) and devolved administrations.

7.2.19 Statutory responsibility for achieving EU limit values rests with the Secretary of State and local authorities have no responsibility for achieving the national

[11] http://www.sepa.org.uk/waste/waste_regulation/landfill.aspx
[12] H1 Horizontal Guidance Note : Assessment & Appraisal of BAT, available at http://www.sepa.org.uk/air/process_industry_regulation/pollution_prevention__control/uk_technical_guidance/uk_horizontal_guidance/h1.aspx

air quality criteria, although they should contribute to this through local action plans designed to reduce pollution levels in AQMAs.

7.3 Methodology

Construction

Traffic Emissions

7.3.1 Temporary changes in local air quality may occur due to exhaust emissions from construction / operative vehicles travelling to and from construction sites. Exhaust emissions from construction traffic vehicles have the potential to affect local air quality at sensitive receptors, if they are located close to (within 200 metres) haul routes. From an air quality perspective, sensitive receptors include residential properties and locations where there are likely to be vulnerable occupants, such as hospitals, nursing homes and schools, as well as ecological sites.

7.3.2 EPUK development control guidance[13] suggests that an air quality assessment is required for proposals that would significantly alter the traffic composition on local roads, for instance, increasing the number of heavy duty vehicles by around 200 movements or more per day.

Dust Emissions

7.3.3 Construction activities have the potential to generate dust, which may have an adverse effect on nearby properties. A particular complication in determining whether or not nuisance dust levels constitute a Statutory Nuisance is the absence of a quantitative standard. A limited number of academic studies in the UK have examined this issue by sampling public opinion to various 'dust levels' but have yet to define one or more thresholds above which Statutory Nuisance can be confidently determined.

7.3.4 Quantitative assessments are not usually carried out due to the uncertainty inherent in source emission rates for fugitive sources. Generally, a qualitative assessment of risk is undertaken, considering the locations of residential and

[13] EPUK (2010) Development Control: Planning for Air Quality (2010 update), paragraph 5.6; available at http://www.iaqm.co.uk/text/guidance/epuk/aq_guidance.pdf

other sensitive properties within 200 metres of construction activities, which could be at risk of being affected. The main purpose of the construction dust assessment is to highlight potentially sensitive receptors so that appropriate mitigation to prevent and control dust emissions can be rigorously applied at the time of construction.

Operation

Odour

7.3.5 A detailed odour assessment was carried out for the biofilter emissions associated with the consented waste facility. With the ATT plant in place there would no longer be a bio-stabilisation process, and hence odour emissions from the biofilter are likely to be reduced. For the purposes of this assessment, the findings of the assessment for the consented scheme are used, as they provide a conservative basis for assessment. Consideration is given to the new residential development to the south of the proposed facility which introduces new sensitive receptors.

Oxides of Nitrogen

7.3.6 To determine the effects of the proposed ATT plant emissions on local air quality for planning purposes, an atmospheric dispersion model has been used. The study uses information provided by NES.

7.3.7 The dispersion modelling study considers the atmospheric discharges of oxides of nitrogen, from the pyrolysis and gasification (NEAT) units and associated engines. Four such process lines will be installed with one unit out of use as a standby. The modelling addresses the maximum rate of operation of the development entailing three NEAT units and three engines operating concurrently.

7.3.8 For the purposes of this assessment, it has been assumed that oxides of nitrogen will be continuously emitted from the pyrolysis and gasification units at the WID concentration limit throughout the year, a highly conservative assumption. The principal exhaust emission, however, is from the spark

ignition engines. As a conservative assumption, the oxides of nitrogen emissions from the engines are modelled assuming a continuous release at the limit specified for landfill gas engines.

Model Choice

7.3.9 The dispersion modelling of exhaust emissions was carried out using the United States Environmental Protection Agency (US EPA) model AERMOD PRIME[14] version 12060. This model is the result of many years development by the US EPA and the American Meteorological Society. It has been developed as a regulatory model that incorporates the current understanding of atmospheric physical processes. This model is used by regulatory agencies, consultants and industry worldwide to assess the impact of air emissions from point, area, line, flare and volume sources. The model is commonly used in the UK for planning and regulatory applications.

7.3.10 AERMOD simulates essential atmospheric physical processes and provides refined concentration estimates over a wide range of meteorological conditions and modelling scenarios. The modelling system includes:

- An advanced meteorological pre-processor to compute site-specific planetary boundary layer (PBL) parameters;
- Highly developed dispersion formulations that incorporate current PBL understanding and variables for both convective and stable boundary inversions;
- Enhanced treatment of plume rise and plume penetration for elevated inversions allowing for effects of strong updrafts and downdrafts that occur in unstable conditions;
- Improved computation of vertical profiles of wind, turbulence and temperature; and
- A 'dividing streamline' approach for computations in complex terrain.

7.3.11 AERMOD includes two data pre-processors for streamlining data input: AERMET, a meteorological pre-processor, and AERMAP, a terrain pre-processor. The model can address both local topography and building downwash effects concurrently, where relevant to the study. The model

[14] AERMOD software provided by Trinity Consultants Inc, http://www.breeze-software.com/

provides reasonable estimates over a wide range of meteorological conditions and modelling scenarios. The building downwash algorithms in AERMOD PRIME, using parameters calculated by the Building Parameter Input Program (BPIP), distinguish this model from earlier versions of AERMOD, which used simpler procedures to address downwash.

Meteorological Data

7.3.12 The most appropriate meteorological station for the dispersion modelling study is the Charterhall RAF Met Office site. An hourly sequential meteorological data file from Charterhall for the five year period 2006 to 2010 was used in the modelling. The meteorological station is located at grid reference NT 7592 4618 (10 m precision) approximately 27.8 kilometres to the east north east of Easter Langlee, and hence the data is considered to be representative of the application site.

7.3.13 The five year meteorological data file from Charterhall contains over 43,000 hourly records, and is quite adequate to characterise local meteorology in terms of both extreme events and long-term average conditions for the purposes of dispersion modelling. This meteorological data is presented as a wind rose in Figure 7.5.

7.3.14 The meteorological pre-processor AERMET was used to process the data and estimate the necessary boundary layer[15] parameters for dispersion calculations in AERMOD. The data were processed to take account of the location and surroundings of the meteorological station and of the modelled facility. These parameters, together with observed near-surface wind and temperature data, were used to model how pollutants disperse in the atmosphere.

7.3.15 The meteorological data pre-processor AERMET was used to create the site-specific surface and upper air data files required by AERMOD PRIME.

[15] The atmospheric boundary layer is that region between the earth's surface and the overlying, free flowing atmosphere. The fluxes of heat and momentum drive the growth and structure of this boundary layer. The depth of this layer and the dispersion of pollutants within it are influenced on a local scale by surface characteristics, such as the roughness of the underlying surface, the reflectivity of the surface (albedo) and the amount of moisture available at the surface (Bowen ratio). From these inputs AERMET calculates severable boundary layer parameters which in turn influence pollutant dispersion, including surface friction velocity, sensible heat flux, Monin-Obukhov length, daytime mixing layer height and nocturnal surface layer height, and the convective velocity scale.

7.3.16 Surface characteristics were specified to reflect the nature of the area surrounding the facility. According to latest US EPA guidance, the near-field land use within a one kilometre circle was evaluated to determine the surface roughness length[16]. Land use may be specified by several directional sectors. In this case a sector between 220º and 262º was considered to be of an urban nature and the remaining area principally cultivated land.

7.3.17 The Bowen ratio[17] and albedo[18] were determined by the dominant land use categories within the far-field, a 10 by 10 kilometre square. A subjective determination of the percentages of each type of land use was made based on maps and aerial photographs. The land use proportions are simply averaged over the area and are independent of distance or direction from the site. The categories of cultivated land, urban, deciduous woodland and coniferous woodland comprised 77%, 14%, 5% and 4% respectively. Based on the land use information, the AERMET pre-processor generated the appropriate default annual average values for the surface parameters, as shown in Table 7.2.

Table 7.2: Surface Characteristics

Direction Degrees	Land Type	Albedo	Bowen Ratio	Roughness Length, m
220 - 262	Urban	0.2625	0.882	1.0000
262 - 220	Cultivated land	0.2625	0.882	0.0725

Receptors

7.3.18 Ground level concentrations were modelled using a Cartesian receptor grid at 100 metre resolution. In a local area around the facility a second grid of 25 metre resolution ensures that the maximum concentrations were modelled.

7.3.19 The model was set up to report the maximum hourly, 24-hourly and the annual average pollutant concentrations found at each point on the receptor

[16] Surface roughness length is a measure of the height of obstacles to wind flow. It is not equal to the physical dimensions of obstacles, but is generally proportional to them.
[17] The Bowen ratio is a measure of the amount of moisture at the earth's surface. This influences other parameters which in turn affect atmospheric turbulence.
[18] Noon-time albedo is the fraction of incoming solar radiation reflected from the ground when the sun is directly overhead. Adjustments are made in AERMET to incorporate the variation in the albedo with solar elevation angle.

grids. As a five-year meteorological data file was used, the maximum hourly result is the highest in over 43,000 hours processed.

7.3.20 A selection of sensitive properties representative of those closest to the facility has been included in the model as discrete receptors; these receptors are shown in Figure 7.2 and are identified in Table 7.3 (overleaf), which also shows to the nearest 10 metres the distance of each location from the ATT plant exhaust (shown as a small red dot on the figure, near the eastern site boundary).

7.3.21 To the west, north and east of the site the land is predominantly agricultural. The nearest existing residential property is at Easter Langlee farmhouse to the south west of the ATT exhaust. There are a number of houses on Loan View, 450 metres to the west south west and at Wester Housebyres, approximately 850 metres to the east north east of the exhaust. Permission has also been granted for new residential development to the south west of the application site, the nearest property within this development will be around 200 metres from the exhaust.

Table 7.3: Key to Modelled Residential Receptors

Receptor	Address	Location		Distance (m)
		Eastings	Northings	
1	10 Loan View	351718	635940	480
2	1 Easter Langlee	351918	635844	370
3	9 Loan View	351724	635976	470
4	Wester Housebyres	352975	636435	870
5	Lowood	352101	635364	750
6	Pavilion Farm	352731	635421	890
7	Gattonside Mains	353634	635420	1620
8	Langlee Mains Farmhouse	350857	636588	1400
9	Glendearg	351750	637995	1930
10	New residential development	352000	635925	180

7.3.22 The SEPA H1 guidance requires an air quality assessment to address designated ecological sites. This entails evaluation against critical levels specified for oxides of nitrogen and against critical loads for nitrogen deposition. The H1 guidance recommends that designated sites including Special Protection Areas (SPAs), Special Areas of Conservation (SACs) or Ramsar sites and SSSI be considered where they fall within ten kilometres of

the installation. For smaller facilities such as the one proposed at Easter Langlee, a search radius of just a few kilometres is normally adequate to demonstrate the effects on air quality.

7.3.23 The DEFRA website[19] was used to find information regarding nationally designated ecological sites in the vicinity of the proposed development. Further information on specific designated sites is published by Scottish Natural Heritage (SNH)[20].

7.3.24 There are no SPAs or Ramsar sites within ten kilometres of the proposed facility, while there are four SACs. In addition, there are three SSSIs within two kilometres. These designated ecological sites are shown in Table 7.4, together with their qualifying interest features for designation.

Table 7.4: Designated Ecological Sites

Name	Designation	Qualifying Interest
River Tweed	SAC, SSSI	River lamprey, Brook lamprey, Otter, Sea lamprey, Atlantic salmon. Rivers with floating vegetation often dominated by water-crowfoot.
Avenel Hill and Gorge	SSSI	Broadleaved, mixed and yew woodland (upland oak woodland), butterflies
Gattonside Moss	SSSI	Basin fen (medium to rich), beetle assemblages
Borders Woods	SAC	Mixed woodland on base-rich soils
Threepwood Moss	SAC	Active raised bog, degraded raised bog
Whitlaw and Branxholme	SAC	Base-rich fens, feather-moss, transition mires with unstable, quaking surface

7.3.25 Locations representing the nearest boundary of the designated sites were selected as discrete receptors in the dispersion model; in some cases two points were chosen where the designated feature is extensive. The ecological receptors included in the model are shown graphically in Figure 7.3 These selected receptors are listed in Table 7.5 over the page.

[19] http://magic.defra.gov.uk/
[20] http://www.snh.gov.uk/protecting-scotlands-nature/protected-areas/local-designations/local-nature-conservation/

Table 7.5: Key to Discrete Ecological Receptors

Receptor ID	Site	Location		Distance* (m)
		Eastings	Northings	
A	The Allan Water (part of the River Tweed SAC) (1 of 2)	352310	636204	170
B	The Allan Water (part of the River Tweed SAC) (2 of 2)	352326	636097	160
C	Avenel Hill and Gorge SSSI (1 of 2)	352380	636720	650
D	Avenel Hill and Gorge SSSI (2 of 2)	352120	636470	370
E	River Tweed SSSI (1 of 2)	351912	635522	640
F	River Tweed SSSI (2 of 2)	352573	635330	880
G	Gattonside Moss SSSI	354618	636757	2520
H	Borders Woods SAC	358310	632550	7100
I	Threepwood Moss SAC	352000	642000	5890
J	Whitlaw and Branxholme SAC	350950	629360	6860

Terrain

7.3.26 Terrain elevations for all model objects (i.e. exhausts and buildings) and receptors were used in the dispersion model, as derived from Ordnance Survey digital terrain data files. The site was assumed to be levelled at 133m above ordnance datum (AOD).

Building Downwash

7.3.27 Buildings close to point source plume discharges that are more than 40% of the exhaust height may potentially cause downwash effects. The BPIP programme was used to calculate for each wind sector the direction specific building downwash parameters for the ATT plant exhaust to be used by AERMOD PRIME in the dispersion calculations.

7.3.28 The ATT plant is shown in Figure 7.4 as viewed from the north east. The thin blue line to the left of the figure near the eastern site boundary (left in the figure below) is the biofilter vent (not modelled); the biofilter itself is a low structure and hence it is not shown in the figure. The central thin blue line represents the 23 metre multiple-flue ATT plant exhaust. The adjacent building to the left as shown is 12 metres high, as is the reception hall at the other end of the facility. The central part of the facility is 9 metres high.

Emission Characteristics

7.3.29 The exhaust will be discharged at a height of 23 metres above ground level. The exhaust height was determined by D1 calculation using the HMIP methodology[21] and then verified and adjusted as appropriate based on initial dispersion modelling findings.

7.3.30 The multiple-flue exhaust discharge incorporates a single flue for the Gasifier units and one flue for each of the engines. There are four engine flues although there is always one engine on standby and up to three engines in operation. For clarity, the relevant flue gas parameters for the Gasifier units and the engines are shown separately below. The dispersion model treats the exhaust as a single combined discharge and hence the appropriately combined parameters were calculated; these are then presented in the last of the three tables below.

7.3.31 The Gasifier units' emission characteristics are shown in Table 7.6 over the page. These input data have been derived from the engineering design information provided by NES. The exhaust emissions will be required to meet the pollutant concentration limits specified in the Industrial Emissions Directive for waste incineration (the "WID" limits), which for NO_x is 200 mg/Nm^3.

[21] Guidelines on Discharge Stack Heights for Polluting Emissions, HMIP Technical Guidance Note (Dispersion) D1, 1993

Table 7.6: Gasifier Units Exhaust Discharge Characteristics

Parameter	Value
Flue diameter, m (single)	0.293
Exhaust gas temperature, °C	293
Exhaust gas exit velocity, m/s	25.05
Actual exhaust gas flow rate, m^3/s	1.689
Oxygen content of actual wet gas flow, %	5.2
Water content of actual gas flow, %	13.3
Exhaust gas flow rate at WID reference conditions (273 K, 101.3 kPa, 11% O_2 dry basis), Nm^3/s	1.063
Oxides of nitrogen emission rate for 200 mg/Nm^3 (WID reference conditions), g/s	0.213

7.3.32 The overall engine emission characteristics, at the normal maximum load operational condition of three engines operating concurrently, are shown in Table 7.7. The engine exhaust emissions will be required to meet the pollutant concentration limits specified in SEPA guidance[22] for landfill gas engines, which for NO_x is 500 mg/Nm^3.

Table 7.7: Engine Exhaust Discharge Characteristics

Parameter	Value
Equivalent flue diameter, m (three flues each 0.344 m)	0.596
Exhaust gas temperature, °C	250
Exhaust gas exit velocity, m/s	25.0
Actual exhaust gas flow rate, m^3/s	6.986
Oxygen content of actual wet gas flow, %	5.7
Water content of actual gas flow, %	12.9
Exhaust gas flow rate at Landfill Gas Engine reference conditions (273 K, 101.3 kPa, 5% O_2 dry basis), Nm^3/s	2.868
Oxides of nitrogen emission rate for 500 mg/Nm^3 (Landfill Gas Engine reference conditions), g/s	1.434

7.3.33 The combined discharge characteristics for the exhaust as modelled are summarised in Table 7.8. The flue diameter quoted is equivalent to the total cross-sectional area of the various flues, and the flow rates are the total flue gas discharge. The mass emission rate of oxides of nitrogen is the sum of the above emission rates for the Gasifier units and the engines. The proposed exhaust discharge height for the combined flue meets the minimum height requirements[23] for operation at full capacity as described above.

[22] LFTGN 08, Guidance for monitoring landfill gas engines, Environment Agency, 2004
[23] Guidelines on Discharge Stack Heights for Polluting Emissions, HMIP Technical Guidance Note (Dispersion) D1, 1993

Table 7.8: Multiple Flue ATT Plant Exhaust Discharge Characteristics

Parameter	Value
Location of ATT exhaust (National Grid Ref.), m	352170, 636110
Height of release point above ground level, m	23
Equivalent flue diameter, m	0.664
Exhaust gas temperature, ℃	258
Exhaust gas exit velocity, m/s	25.04
Actual exhaust gas flow rate, m^3/s	8.675
Oxides of nitrogen emission rate, g/s	1.647

Ecological Assessment

7.3.34 An assessment of the effect of the ATT plant emissions at the closest designated ecological sites was undertaken to determine whether the annual average criterion (critical level) for oxides of nitrogen, set for the protection of vegetation, would be exceeded.

7.3.35 For the statutory designated ecological sites, where the modelled increment to ground level concentrations exceeds 1% of the vegetation limit value, the modelled increments are used to calculate the dry nitrogen and acid deposition rates due to the emissions from the facility. The equation for the calculation of nitrogen deposition is shown in Equation 1. Acid deposition rates for nitrogen and sulphur were calculated using conversion factors in guidance for Appropriate Assessment[24].

Equation 1 – Calculation of Nitrogen Deposition

Deposition rate (kg N/ha/yr) = NOx concentration * deposition velocity(a) * 14/44 * 31557600/100000

(a) taken from AQTAG06 = 0.0015 m/s, for grassland, 0.003 for woodland.

7.3.36 The increment in total deposition rate is then added to the background rate of deposition available from the Air Pollution Information System (APIS) website[25] and the total compared with the relevant UNECE critical load, which varies according to the type of sensitive ecosystem present. The

[24] Environment Agency Air Quality Technical Advisory Group (AQTAG)06 - Technical Guidance on detailed modelling approach for an appropriate assessment for emissions to air. April 2010. Version 10.
[25] http://www.apisdev.ceh.ac.uk/

critical loads for the statutory designated ecological sites considered in the assessment are presented in Table 7.9.

Table 7.9: Critical Loads for Nearby Sensitive Habitats

Site	Habitat type	Nitrogen critical load, kg N/ha/yr	Acid MinCL MaxN, keq/ha/yr
River Tweed SAC & SSSI	Water course	n/a	n/a
Avenel Hill and Gorge SSSI	Upland oak woodland	10 - 15	1.08
Gattonside Moss SSSI	Rich fens	15 - 30	n/a
Borders Woods SAC	Mixed woodland	15 - 20	1.17
Threepwood Moss SAC	Active raised bog	5 - 10	0.55
Whitlaw and Branxholme SAC	Quaking fens	10 - 15	0.57

Assessment Criteria

7.3.37 The results of the air dispersion modelling study are evaluated in terms of increments or 'process contributions' (PC) to existing concentrations, in the context of the relevant air quality criteria for human health and vegetation. The long-term and short-term PCs were also considered in the context of the existing background concentrations, in order to derive total 'predicted environmental concentrations' (PEC) as outlined in the SEPA Horizontal Guidance Note H1.

7.3.38 The criteria for human health are set for nitrogen dioxide, whereas modelling is undertaken for oxides of nitrogen. The oxides of nitrogen emissions from combustion processes are released almost entirely in the form of nitrogen monoxide. As the plume travels and mixes with air, the nitrogen monoxide slowly oxidises to form nitrogen dioxide. This slow atmospheric reaction depends upon the availability of both ozone and sunlight to proceed. The plume travel time to the nearest residential receptors is in the order of several minutes only, thus restricting the degree of oxidation. A secondary reaction with oxygen may take place without sunlight, but this is extremely slow and hence is not a relevant consideration in the context of the local study area.

Given the lower rate of oxidation at night time, it appears reasonable to assume that long-term average conversion factors would in fact be lower than the short-term daytime factor.

7.3.39 For the short travel distances between the proposed ATT plant and the nearest sensitive receptors, a conversion factor of up to 20% could be regarded as being a relatively conservative assumption for short term averaging periods. Studies by Janssen[26] of oxidation rates in power station plumes found conversions below 20% for distances of up to at least two kilometres from the source, other than during high ozone episodes.

7.3.40 The H1 SEPA guidance describes a very conservative procedure for the conversion of oxides of nitrogen to nitrogen dioxide. This uses unrealistically high conversion ratios of 50% for short-term and 100% for long-term average concentrations. The Environment Agency's Air Quality Modelling and Assessment Unit (AQMAU) suggests a phased approach, the second phase of which is termed a 'worse case scenario' sic, and uses conversion ratios of 35% for short-term and 70% for long-term average concentrations. These conservative conversion ratios are used in the current assessment, which is consistent with the RPS (2011) report for the consented waste facility.

7.3.41 The modelled long-term PC as nitrogen dioxide is added to the background annual mean concentration to determine the PEC. Short-term nitrogen dioxide concentrations, obtained assuming the 35% conversion rate, are added to twice the background annual mean concentration and compared to the relevant air quality criteria.

7.3.42 The rates of nitrogen and acid deposition based on modelled concentrations of oxides of nitrogen at sensitive ecological sites are assessed with reference to background deposition rates and the recommended ranges of critical loads. The assessment of acid deposition uses the 'MinCLMaxN' criterion[27].

[26] Janssen L.H.J.M., van Wakeren J.H.A., van Durren H. and Elshout A.J. (1988) *A classification of NO oxidation rates in power plant plumes based on atmospheric conditions.* Atmospheric Environment 22, 43-55.
[27] See http://www.apis.ac.uk/clf-guidance for detailed definition and explanation

Areas of Uncertainty or Assumptions

7.3.43 All air dispersion modelling is inherently subject to a degree of uncertainty. However, conservative assumptions have been made throughout the assessment, for instance by overestimating the actual anticipated pollutant emission rates in the use of the WID emission limits, the use of five years of meteorological data to ensure the least favourable hours have been modelled, assuming a "worst case" conversion rate of oxides of nitrogen to nitrogen dioxide and comparing deposition rates to the lower range of critical loads for ecological receptors.

7.3.44 The conclusions drawn are therefore considered to be robust, as the uncertainty in the modelling is considered to be small in comparison with the overall scale of the safety factors built into the above conservative assumptions.

7.4 Baseline

Local Air Quality Monitoring

7.4.1 To provide an indication of existing air quality, publicly available information has been drawn from the DEFRA UK-Air website[28] and the most recent air quality review and assessment reports of SBC.

7.4.2 SBC has routinely reviewed air quality conditions within their authority area in accordance with national requirements for Local Air Quality Management (LAQM). The 2012 Air Quality Updating and Screening Assessment Report[29] reconfirmed conclusions from earlier rounds of assessment, such that no exceedances of Air Quality Strategy (AQS) pollutant objectives were anticipated and there was no requirement to move to detailed assessment. No other new / proposed industrial installations have been identified in the Galashiels area, other than the consented waste facility at Easter Langlee.

[28] http://uk-air.defra.gov.uk/
[29] Scottish Borders Council, 2012 Air Quality Updating and Screening Assessment for Scottish Borders Council, April 2012 (report provided via email by David Brown, Environment and Infrastructure Division)

7.4.3 Within the Scottish Borders, the Peebles CMS is operated as part of the Automatic Urban and Rural Network (AURN). It is an urban background site, located at grid reference 324815, 641088, approximately 27 km to the west of the Easter Langlee site. Monitoring statistics available from the UK-Air website[30] report annual mean NO_2 concentrations of 7 µg/m^3 in 2011 (the most recent year for which a full set of ratified monitoring data is available). Annual mean NOx concentrations are reported as 10 µg/m^3 in 2011.

7.4.4 Nitrogen dioxide concentrations are also measured by the local authority using passive diffusion tubes. The results for the monitoring sites closest to the study area are shown in Table 7.10 below. The annual mean objective of 40 µg/m^3 was met at all sites including kerbside (K) locations. Concentrations at the urban background (UB) site in Galashiels (site no. 2) were between 10 and 12 µg/m^3, slightly higher than at Peebles and Melrose but nonetheless well below the objective.

Table 7.10: Nitrogen Dioxide Diffusion Tube Measurements (µg/m^3)

Site ID	Location	Grid reference		Site type	Annual mean			
					2008	2009	2010	2011
1	Council Chamber, Galashiels	349298	635928	K	23	18	17	15
2	Stanley / Meigle St. Galashiels	348587	636142	UB	10	10	12	10
3	High St., Galashiels	348953	636445	K	37	35	38	38
4	Gladstone Pl., Peebles	324757	640643	UB	9	9	10	-
5	High St., Peebles	325085	640389	K	23	21	24	-
15	St. Dunstan's Park, Melrose	354548	634038	UB	7	10	8	-
16	Rogerson's High St Galashiels	349063	636287	K	-	33	32	32
17	Border Angling, High St, Galashiels	348976	636371	K	35	36	38	39
18	Edingtons, High St, Galashiels	348982	636384	K	29	28	35	31
19	Iceland, High St, Galashiels	349063	636272	K	35	33	35	37

7.4.5 The annual mean nitrogen dioxide concentration measured by diffusion tube at the urban background site in Galashiels in 2011 has been selected for use as a background concentration in the assessment of impacts on human health. This value of 10 µg/m^3 is consistent with the value used in the RPS report for the consented waste facility.

[30] http://uk-air.defra.gov.uk/data/exceedence?

Nitrogen and Acid Deposition

7.4.6 The APIS website contains estimates of background concentrations and deposition rates for use in ecological assessments. Annual mean background concentrations of oxides of nitrogen, and rates of nitrogen and acid (nitrogen only) deposition, for each of the designated sites have been downloaded from the website. The data for the statutory ecological sites considered in this assessment are presented in Table 7.11.

Table 7.11: Background Concentrations and Deposition Rates at Ecological Sites

Site	Habitat type	Oxides of nitrogen, µg/m^3	Nitrogen deposition, kg N/ha/year	Acid (N) deposition keq/ha/year
River Tweed SAC & SSSI	Water course	7.5	14.14	1.01
Avenel Hill and Gorge SSSI	Oak woodland	7.3	28.94	2.07
Gattonside Moss SSSI	Rich fens	7.1	17.68	1.26
Borders Woods SAC	Mixed woodland	7.5	28.56	2.04
Threepwood Moss SAC	Active raised bogs	6.4	15.96	1.14
Whitlaw and Branxholme SAC	Quaking fens	7.5	17.78	1.27

7.4.7 It should be noted that the oxides of nitrogen concentrations given in the table above were taken from the relevant 5 by 5 km grid square within which each designated site is situated. As the oxides of nitrogen concentration measured at the Peebles AURN monitoring station is higher, the measured (as opposed to estimated) concentration has been used in the assessment to provide a more conservative evaluation.

Meterological Data

7.4.8 As discussed in paragraph 7.3.12, the most appropriate meteorological station for the dispersion modelling study is the Charterhall RAF Met Office site.

7.4.9 The meteorological data were used to generate a frequency distribution of wind speed and direction. The data is presented as a wind rose diagram in Figure 7.5. It is evident from the data that there is a strongly prevailing wind from the south-west and there are also higher than average wind frequencies from the west south west and from the west. Winds from these five sectors comprise over 53% of total winds, rather than the 30.8% that would arise from an evenly distributed case. In contrast, winds from the north north-east and the adjoining sectors are particularly infrequent. Calms are shown as 4.2% of the data and there are less than 1.8% missing hours.

7.5 Potential Impacts and Mitigation

Construction

Transport Emissions

7.5.1 Mitigation of air quality impacts due to traffic-derived pollutants is regulated at a national and European level through the introduction of increasingly stringent exhaust emissions criteria, the Euro emissions categories. The scope for mitigating adverse impacts is therefore limited, compared to the reductions in emissions generally achievable through improved vehicle technology.

Dust Emissions

7.5.2 To minimise the risk of causing a Statutory Nuisance it is recommended that the contractor adopts best practicable means (BPM) in controlling dust emissions during construction activities.

7.5.3 The Greater London Authority in partnership with London Councils and with assistance from the Building Research Establishment and the PRECIS Working Group (Partnership in Reducing Emissions from Construction Industry Sites), has produced a best practice guidance document[31] for the control of dust and emissions from construction and demolition works. This guidance builds on other guidance and is relevant to all works not just those

[31] http://www.iaqm.co.uk/text/guidance/iaqm_mitigation_measures_2012.pdf

within the London area. It establishes best practice that is relevant and achievable, with the overarching aim of protecting public health.

7.5.4 With reference to this guidance, for a "low risk" site the following mitigation measures should be considered for inclusion within the Construction Environmental Management Plan (CEMP):

- Restrict any non-essential site vehicle movements;
- Limit vehicles to designated tracks that can be regularly watered during dry periods;
- Wheel washing at transition points between site and external surfaced roads to prevent mud migration / trackout;
- Vehicles carrying dusty loads should be sheeted;
- Vehicles that access and / or park within the lay down area should be kept clean and well maintained;
- Ensure the condition of the road leading to the lay down area is well maintained and is watered down if there is a risk of dust being raised during dry periods;
- A suitable speed limit should be put in place on the access road (15 mph if surfaced, 10 mph if unsurfaced);
- Carefully plan site layout so that potential dust sources are located as far away from receptors as possible e.g. locate vehicles away from sensitive receptors;
- Undertake daily on-site and off-site inspections to check for dust sources, record inspection results, and produce a log which should be made available to the local authority; and
- Ensure there is an adequate water supply on-site for effective dust / particulate matter suppression / mitigation, using non-potable water where possible

Operation

Odour

7.5.5 As per the consented scheme, the process buildings will be fully enclosed with all storage and processing activities taking place inside the site

buildings. Extracted air will be treated in an emissions abatement plant prior to being exhausted to atmosphere via an elevated exhaust.

Oxides of Nitrogen

7.5.6 The assessment of effects of the proposed ATT plant on air quality has been made with consideration of all necessary abatement technology and mitigation measures incorporated within the design of the plant. Therefore the assessment findings of these residual effects are presented in Sub-section 7.6.

7.6 Assessment of Residual Effects

Construction

Transport Emissions

7.6.1 Construction traffic will be limited and will not exceed the EPUK criterion for assessment. On this basis the effect on local air quality during the construction phase will be negligible.

Dust Emissions

7.6.2 The potential for dust emissions is small given the limited works that will be required on site to accommodate the ATT plant. Dust emissions will be controlled by mitigation measures set out in the CEMP such that residual effects will be negligible.

Operation

Odour

7.6.3 The findings of the odour assessment for the consented scheme determined that odour emissions from the proposed biofilter ventilation stack would be very unlikely to lead to odour annoyance at the modelled receptors. With the

ATT plant in place there would no longer be a biostabilisation process, and hence odour emissions from the biofilter are likely to be reduced.

7.6.4 Planning consent has recently been granted for a new residential development to the south of the proposed facility. Although this may introduce new sensitive receptors closer to potential odour sources than those previously modelled for the consented scheme, the prevailing wind direction (from the south west) would tend to not transport odour to these residential receptors and the new receptors would remain out-with the 0.5 ou_E/m^3 (European odour units per cubic metre) contour shown in Figure 5 of the Air Quality Assessment for the consented scheme.

Oxides of Nitrogen

Annual Mean

7.6.5 The modelled annual average ground level oxides of nitrogen concentrations resulting from the proposed ATT plant emissions are shown graphically in Figure 7.6. The contour plot demonstrates the dispersion pattern of off-site ground level concentrations.

7.6.6 The pattern of dispersion reflects the long-term frequencies of winds depicted in the wind rose in Figure 7.5. The effects of the proposed ATT plant emissions are relatively localised, the highest annual average oxides of nitrogen concentration of 4.9 $\mu g/m^3$ occurring 150 metres to the north-east of the ATT plant exhaust, beyond the site boundary over land that encompasses a car park and leachate lagoons. There is a secondary maximum to the south west, where concentrations are 1.5 $\mu g/m^3$ or less. Concentrations reduce rapidly with increasing distance from these maxima, such that in the majority of the surrounding area, increments in the annual average are less than 1 $\mu g/m^3$.

7.6.7 The annual average nitrogen dioxide PC at the nearest residential receptors are shown in Table 7.12, assuming a conservative 70% conversion ratio from oxides of nitrogen. The highest concentration at any residential receptor is found at receptor 10, located on the northern edge of the planned residential

development to the south of the facility. Here the maximum increment to annual average oxides of nitrogen concentrations is 1.0 µg/m^3. The modelled increment is equivalent to 0.7 µg/m^3 as nitrogen dioxide, less than 2 % of the AQS objective of 40 µg/m^3.

Table 7.12: Annual Average Oxides of Nitrogen Results Summary

ID	Receptor	Annual NO_x, µg/m^3	Annual NO_2, µg/m^3	PC/AQS, %	PEC NO_2, µg/m^3	PEC/AQS, %
1	10 Loan View	0.6	0.4	1.0	10.4	26.0
2	1 Easter Langlee	0.7	0.5	1.3	10.5	26.3
3	9 Loan View	0.6	0.4	1.0	10.4	26.0
4	Wester Housebyres	0.8	0.5	1.4	10.5	26.4
5	Lowood	0.1	0.1	0.2	10.1	25.2
6	Pavilion Farm	0.1	0.1	0.2	10.1	25.2
7	Gattonside Mains	0.1	0.1	0.3	10.1	25.3
8	Langlee Mains Farmhouse	0.1	0.1	0.2	10.1	25.2
9	Glendearg	0.1	<0.1	0.1	10.0	25.1
10	New development	1.0	0.7	1.7	10.7	26.7

7.6.8 An estimate of the total PEC at nearby receptors was obtained by adding the 2011 nitrogen dioxide concentration measured at an urban background site in Galashiels, 10 µg/m^3, to each modelled contribution. The total concentration within the new development was thus estimated to be 10.7 µg/m^3.

7.6.9 The final column of the table shows the PEC as a percentage of the AQS objective. The estimated total nitrogen dioxide concentrations using this conservative procedure demonstrates that at all receptors - where there may be a relevant exposure over a long-term time period - ambient concentrations will remain well below – around a quarter of - the 40 µg/m^3 AQS objective. These results demonstrate that the effects of the facility emissions are not significant.

7.6.10 Given the highly conservative assumption of 70% conversion to nitrogen dioxide used in the assessment and the use of the WID limits, the actual increments in annual average nitrogen dioxide concentrations are likely to be even lower than those presented.

7.6.11 The maximum annual mean nitrogen dioxide concentration at a residential receptor, modelled by RPS in their assessment of emissions from the biofilter exhaust, was 0.02 µg/m^3. This is less than 2% of the maximum annual mean

ground level concentration modelled at the closest residential receptor in the present study. This increment would make a percentage contribution of less than 0.2% to the total cumulative PEC of 10.7 µg/m^3. The cumulative impact of the combined oxides of nitrogen emissions from the ATT plant and the existing biofilter is therefore assessed as not significant at any residential receptor.

Hourly Mean

7.6.12 The maximum hourly average oxides of nitrogen concentrations are shown in Figure 7.7. The maximum ground level concentration of 196 µg/m^3 occurs over 600 metres north of the facility, on an area of elevated terrain at Fairies Bowling Green. There is a secondary maximum approximately 1.2 km to the west north west of the site, on high ground near Langlee Mains, with concentrations around 150 µg/m^3.

7.6.13 For comparison with the short-term AQS objective for nitrogen dioxide of 200 µg/m^3 (exceedance of this threshold up to 18 times a year is permitted under the AQS), a 35% conversion ratio was applied to the maximum modelled hourly concentrations of oxides of nitrogen. The results for the nearest residential properties are summarised in Table 7.13.

Table 7.13: Hourly Average Oxides of Nitrogen Results Summary

ID	Receptor	Hourly NOx, µg/m^3	Hourly NO_2, µg/m^3	PC/AQS, %	PEC NO_2, µg/m^3	PEC/AQS %
1	10 Loan View	34.6	12.1	6.1	32.1	16.1
2	1 Easter Langlee	32.1	11.2	5.6	31.2	15.6
3	9 Loan View	37.5	13.1	6.6	33.1	16.6
4	Wester Housebyres	9.8	3.4	1.7	23.4	11.7
5	Lowood	9.0	3.2	1.6	23.2	11.6
6	Pavilion Farm	8.6	3.0	1.5	23.0	11.5
7	Gattonside Mains	15.5	5.4	2.7	25.4	12.7
8	Langlee Mains Farmhouse	61.5	21.5	10.8	41.5	20.8
9	Glendearg	42.9	15.0	7.5	35.0	17.5
10	New development	46.7	16.3	8.2	36.3	18.2

7.6.14 The maximum short-term concentration at any residential receptor is found at receptor 8, Langlee Mains Farmhouse, where the maximum hourly average increment as nitrogen dioxide is 21.5 µg/m^3, the equivalent of 11% of the AQS objective. Adding twice the annual background concentration to the PC

gives an estimate of the short-term PEC. It is evident from the table that at the majority of locations this is dominated by the background contribution, and is, at most, just a fifth of the short-term AQS objective of 200 µg/m^3.

7.6.15 It can be seen that total concentrations are well below the AQS short-term criterion at all residential receptors. At the location of the maximum ground level concentration, which can conservatively be used to represent all public open space, the PEC would be 88 µg/m^3, or less than half the criterion. These results demonstrate that the effects of the facility emissions on short-term concentrations are not significant.

7.6.16 An assessment of cumulative hourly emissions is not required. With regard to the maximum annual average results modelled at each receptor location, the cumulative effects are additive. This is not the case for the modelled maximum hourly short-term results, as for the individual sources, different hours of meteorological data will produce the maximum hourly result.

Ecological Sites

7.6.17 The modelled annual average concentrations of oxides of nitrogen at sensitive ecological sites identified within the vicinity of the development are summarised in Table 7.14 and are compared with the critical level for this pollutant of 30 µg/m^3. A background of 10 µg/m^3 was to calculate PEC.

Table 7.14: Oxides of Nitrogen Concentrations at Ecological Sites

Site ID	Description	PC NO_x µg/m^3	PC / AQS %	PEC NO_x µg/m^3	PEC / CL %
A	The Allan Water (part of the River Tweed SAC) (1 of 2)	4.5	15%	14.5	48.3%
B	The Allan Water (part of the River Tweed SAC) (2 of 2)	1.4	4.6%	11.4	37.9%
C	Avenal Hill and Gorge SSSI (1 of 2)	1.0	3.2%	11.0	36.5%
D	Avenal Hill and Gorge SSSI (2 of 2)	0.22	0.7%	10.2	34.1%
E	River Tweed SSSI (1 of 2)	0.24	0.8%	10.2	34.1%
F	River Tweed SSSI (2 of 2)	0.10	0.3%	10.1	33.7%
G	Gattonside Moss SSSI	0.10	0.3%	10.1	33.7%
H	Borders Woods SAC	0.02	0.1%	10.0	33.4%
I	Threepwood Moss SAC	0.02	0.1%	10.0	33.4%
J	Whitlaw and Branxholme SAC	0.01	< 0.1%	10.0	33.4%

7.6.18 The maximum modelled increment to oxides of nitrogen due to emissions from the proposed ATT plant is 4.5 µg/m^3 or 15 % of the vegetation critical

level of 30 µg/m^3; this increment occurs within the River Tweed SAC, where it falls under the area of maximum plume concentrations. The background oxides of nitrogen concentration at this location are estimated to be 10 µg/m^3; the maximum concentration within the SAC site is hence calculated to be 14.5 µg/m^3 which is less than half the critical level for vegetation. It is clear from the contour plot in Figure 7.6 that only a small section of the SAC, located directly to the east of the facility, would be affected by increments of over 1 µg/m^3. The contribution of the ATT plant is unlikely to have any material effect on vegetation within this aquatic site, not least due to the fast flowing nature of the water body.

7.6.19 The second highest increment to oxides of nitrogen at a sensitive ecological site occurs at the Avenel Hill and Gorge SSSI. Here, the maximum contribution from the facility is 1 µg/m^3 or 3%of the objective. However, over the majority of the site the increment from the facility would be less than 0.3 µg/m^3 or just 1 % of the critical level. The PEC at the point of maximum ground level concentration within the site is 10.9 µg/m^3 or just over a third of the critical level.

7.6.20 At all other ecological sites, the ATT plant makes a negligible additional contribution to existing ambient concentrations, equivalent to less than 1 % of the critical level. Total concentrations would be around a third of the criterion in all cases, dominated by the background component.

7.6.21 The additional impact from the biofilter emissions at these ecological sites is not significant. At the River Tweed SAC it contributes an additional 0.27 µg/m^3. The total PEC would remain at less than half the criterion at this site, which is not sensitive to effects of air pollution. The additional impact from the biofilter emissions at the Avenel Hill and Gorge SSSI location is 0.01 µg/m^3 which is negligible in the context of the total PEC.

7.6.22 The rates of nitrogen and acid deposition have been calculated at the closest designated sites. All of the oxides of nitrogen were conservatively assumed to be as nitrogen dioxide in undertaking this assessment. The deposition velocity for “forest” was used for Avenel Hill and Gorge SSSI, while that for “grassland” was used for Gattonside Moss and the River Tweed. The results

of the calculations are presented in Table 7.15, which also shows the contribution of the proposed energy facility as a percentage of the lower and upper critical loads for deposition, where these were identified from APIS.

Table 7.15: Nitrogen and Acid Deposition at Designated Sites, kg N/ha/yr

Site ID	Description	PC as N deposition kg N/ha/yr	Critical load range, kg N/ha/yr	PC as % of N dep critical load range	N acid dep rate keq/ha/yr	MinCL Max N keq/ha/yr	PC as % of MinCL MaxN
A	River Tweed SAC (1 of 2)	0.646	n/a	n/a	0.046	n/a	-
B	River Tweed SAC (2 of 2)	0.199	n/a	n/a	0.014	n/a	-
C	Avenal Hill and Gorge SSSI (1 of 2)	0.273	10 - 15	1.8 – 2.7%	0.020	1.08	1.8%
D	Avenal Hill and Gorge SSSI (2 of 2)	0.062	10 - 15	0.4 – 0.6%	0.004	1.08	0.4%
E	River Tweed SSSI (1 of 2)	0.035	n/a	n/a	0.002	n/a	-
F	River Tweed SSSI (2 of 2)	0.015	n/a	n/a	0.001	n/a	-
G	Gattonside Moss SSSI	0.014	15 - 30	<0.1 - 0.1%	0.001	n/a	-

7.6.23 There are no critical loads available for the River Tweed and nitrogen deposition is not considered to be a relevant concern in this fast-flowing water course. The contribution of the proposed ATT plant within Avenel Hill and Gorge SSSI is between 1.8 and 2.7 % of the critical load range for nitrogen deposition of 10 to 15 kg N/ha/yr at the most affected location. The maximum increment represents less than 1 % of the background deposition rate of 28.9 kg N/ha/yr at this sensitive site. The increment to nitrogen deposition would be less than 1 % of the lower critical load across the majority of the site. On this basis, the effects of the facility emissions are not considered to be significant.

7.6.24 At Gattonside Moss SSSI the facility increment is 0.1 % or less of the critical load range for nitrogen deposition, and is thus considered to be negligible.

7.6.25 The woodland habitat at the Avenel Hill and Gorge SSSI is sensitive to acid deposition. The maximum contribution of the ATT plant emissions to the "MinCL MaxN" represents less than 2 % of this criterion and less than 1% of

the background deposition rate of 2.1 keq/ha/yr. Only a small area of the SSSI, the south east corner of the site, would be subject to increments of more than 1% of the acid deposition criterion of 1.08 keq/ha/yr. On this basis, the effects of the facility emissions are not considered to be significant.

7.6.26 The cumulative deposition rates for nitrogen and acid (including the contribution from biofilter ammonia emissions) are shown in Table 7.16. The results demonstrate that there would be no material cumulative effect at any location due to the combined emissions of the ATT plant and biofilter, as the percentage contributions to the available critical loads change by a negligible 0.1% or less due to the additional biofilter emissions.

Table 7.16: Cumulative Nitrogen and Acid Deposition at Designated Sites, kg N/ha/yr

Site ID	Description	N dep from biofilter NO_x kg N/ha/yr	N dep from biofilter NH_3 kg N/ha/yr	Total N dep kg N/ha/yr	Total Ndep as % of critical load	Total Nacid dep rate keq/ha/yr	Total Nacid dep as % of MinCL MaxN
A	River Tweed SAC (1 of 2)	0.039	0.073	0.758	n/a	0.054	-
B	River Tweed SAC (2 of 2)	0.039	0.073	0.311	n/a	0.022	-
C	Avenal Hill and Gorge SSSI (1 of 2)	0.003	0.007	0.283	1.9– 2.8%	0.020	1.9%
D	Avenal Hill and Gorge SSSI (2 of 2)	0.003	0.007	0.072	0.5 – 0.7%	0.005	0.5%
E	River Tweed SSSI (1 of 2)	0.001	0.004	0.040	n/a	0.003	-
F	River Tweed SSSI (2 of 2)	0.001	0.004	0.020	n/a	0.001	-
G	Gattonside Moss SSSI	0.000	0.001	0.015	<0.1 - 0.1%	0.001	-

7.7 Conclusion

7.7.1 The potential for dust annoyance during the construction phase would be negligible as emissions would be controlled through mitigation measures formalised in a CEMP.

7.7.2 The number of vehicle movements during construction would be limited and the effect on local air quality at sensitive receptors would be negligible.

7.7.3 In light of the anticipated reduction in odour emissions with the ATT plant in place, there would be no change in the conclusions from the assessment for the consented scheme and hence the effect of odour would be negligible.

7.7.4 The ATT plant exhaust emissions of oxides of nitrogen would not affect the achievement of the relevant air quality strategy objectives and critical levels for human health or vegetation. Total ambient concentrations of nitrogen dioxide would remain well below the long-term AQS objective at the nearest residential receptors, including at the new development to the south of the site. There would be no exceedences of the short-term criterion at any location in the surrounding area. The effect of the facility in terms of oxides of nitrogen concentrations and nitrogen deposition rates at designated ecological sites in the area is not considered to be significant.

7.7.5 The potential cumulative effects of the proposed ATT plant when operating concurrently with the adjacent fuel preparation facility would not result in any change in the conclusions of this assessment, either in terms of human health or ecology.

7.7.6 The air dispersion modelling took into account the facility design including the inherent mitigation that will ensure that the ATT plant performance is well within the regulatory limits for all prescribed substances. The dispersion modelling used the highly conservative assumption that emissions will be at the regulatory limits. This robust approach has demonstrated that there would be no exceedences of air quality criteria as a result of facility emissions. In most cases, the ATT plant contribution to ambient concentrations will be negligible.

8.0 ENERGY EXPORT CONNECTIONS

8.1 Introduction

8.1.1 This chapter of the ES assesses the likely significant environmental effects associated with the development of the electrical grid connection and potential heat distribution network associated with the proposed ATT plant at Easter Langlee.

Electrical Generation

8.1.2 It is anticipated that the ATT plant would treat approximately 24,000 tonnes of RDF per annum. This would then be fed into a combined pyrolysis / gasification process which will produce a syngas. Through the combustion of the syngas in a series of dedicated gas engines, the facility would have a gross electrical output in the region of 2.9 MWe. A small proportion of this electricity (circa 180 KWe) would be used within the ATT plant itself. Thus, the net export potential to the local grid network of circa 2.7 MWe. Based upon the facility operating for 8,000 hours per year, this would provide an annual export to the local grid network of 21.76 GWhe.

Heat Recovery

8.1.3 Heat recovery would be from two sources within the proposed ATT plant, these are:

1. Heat from the cooling of the gas engines (estimated output 3.0 MWth) would be recovered through a collection tank and heat exchangers for re-use in the fuel preparation facility (to improve recyclate production, material handling and generate RDF at the desired moisture content of 20%);
2. Waste heat from the engine flue gases would be recovered by heat exchangers and transferred to a large collection / buffer tank accumulator prior to being fed into the District Heating (DH) system. This output is estimated as circa 1.5 MWth (at the exhaust), with an outflow temperature of 120^{o}C. For the purposes of planning the DH

system, it has been assumed that a continuous export potential of 1.2 MWth could be achieved.

8.2 Connection Options

Electricity Connectivity

8.2.1 The grid connection works required to export electricity from the facility do not form part of the planning application and would be authorised either under a further consenting procedure, or under permitted development rights, depending on the nature of the connection. However, on the basis that export of electricity is an integral part of the scheme, it is considered appropriate that the potential environmental impacts associated with the connection to the local electricity grid are assessed within the ES.

8.2.2 The applicant has consulted with the local District Network Operator (DNO) to identify potential grid connection options. The DNO has confirmed that a connection is feasible and provided details of a likely route option.

8.2.3 The most likely connection would be between the site and a new 11kV switching station in the vicinity of the Tweed Road / Winston Road, Galashiels. This would be an underground connection that would be established via underground cabling below the exiting highway network and will include a trenchless river crossing. The precise routing would be determined during the detailed design phase and following further commercial discussions with the DNO.

Heat Connectivity

8.2.4 A separate Heat and Power Plan (HPP) has been prepared in support of the application (see Part 3 of the separately bound Planning Application Document). This sets out the latest identified proposals for heat export together with the steps required to maximise benefits in this regard. The HPP has identified 13 potential heat users and 6 potential future heat off-take opportunities within close proximity of ATT plant site. These users include:

- Properties under the control of 3 separate housing associations;

- Langlee Primary School and Scottish Borders College;
- Glenview Children's Home;
- Commercial properties;
- A kiln drying facility and horticulture polytunnel facility (both of which are proposals that are undeveloped and do not currently benefit from planning permission);
- Owner occupier residential properties (including the Persimmon Homes development to the south of the site);
- Commercial and civic properties under the control of SBC;
- Heriot Watt University Residences; and
- The welfare facility associated with the ATT plant and associated fuel preparation facility.

8.2.5 The location of the identified heat off-take opportunities and potential routing of a heat pipe network is illustrated on Figure 8.2.

8.2.6 Similar to the grid connection, the heat pipe network does not form part of the planning application for the ATT plant and would be authorised by either a separate planning application or through permitted development rights. However, on the basis that export of heat is an integral part of the scheme, it is considered appropriate that the potential environmental impacts associated with the delivery of the heat pipe network are assessed within the ES.

8.2.7 The work carried out in the HPP concludes that the optimum potential for local heat usage is through the export of hot water. It also identifies, for the purposes of planning the District Heating system, that a continuous export potential of 1.2 MWth can be achieved. The assessment has been carried out on this basis.

8.3 Description of Grid Connection Works

8.3.1 The ATT plant would generate electricity through the gas engines. This would be exported from the site via an on-site sub-station (which would be the subject of a separate consenting process). The cable route would exit the Easter Langlee waste management site via the existing private access road and would then proceed in a southerly direction along Langshaw Road, which

connects to the B6374 Melrose Road. The Cable would then proceed along this Melrose Road in a westerly direction before proceeding south along Winston Road. From here, it would pass onto the access road associated with Scottish Waters Waste Water Treatment Works. The cable would then pass within a trenchless excavation under Gala Water before emerging on Galafoot Lane. It would then follow Galafoot Lane before emerging back onto Winston Road where it would terminate in a new switching station.

8.3.2 The cable route / electricity infrastructure would lie almost entirely within the confines of the public highway, private roads, or other areas of hardstanding e.g. car parking areas. The only exceptions to this would be:

- The trenchless excavation (using directional drilling) under Gala Water (which is a tributary to the River Tweed); and
- The construction of a new sub-station on the site of the proposed ATT plant.

8.3.3 The location of the new switching station is yet to be confirmed. However, it is assumed for the purposes of this ES that it would be located on either existing highway verge or a suitable hardstanding area.

8.3.4 The connection between the site and the proposed new switching station would be circa 2.8km in length. The potential electrical grid connection route is illustrated on Figure 8.1.

Construction Methods

8.3.5 The electricity cable would be buried within a trench located within the metalled roadways (including the existing metalled access road to the wider Easter Langlee waste complex), highway verge or footway. The trench would be excavated to a depth of approximately 1m and to a width of approximately 0.7m (the approximate width of an excavating bucket) using a wheeled excavator or similar. The cabling would then be placed within the excavated trench and packed with a layer of sand for protection before being backfilled with excavated material. Road surfaces would then be reinstated and surfaced to the specification required by the highways authority. During the trenching a working area of approximately 3-4m in width would be required

for the operation of machinery and temporary storage of excavated material prior to backfilling. As such appropriate traffic management would need to be put in place along the affected highways.

8.3.6 As noted above, it would be necessary for a section of the cable route that crosses Gala Water to be constructed using trenchless excavation techniques. It is anticipated that this would be through directional drilling which has been specifically proposed to avoid any potential environmental effects upon the Gala Water Special Area for Conservation (SAC) and its environs.

8.3.7 The grid connection works are likely to be undertaken in parallel with the installation of plant and equipment as part of the main construction of the ATT plant and associated fuel preparation facility. The contractor would implement best practice construction methods throughout the period of the works to reduce potential environmental impacts.

8.4 Description of the Heat Pipe Network and Installation Works

8.4.1 As noted previously within this Chapter of the ES an export of circa 1.2 MWth is assumed as the basis for operating the District Heating system. Given the types of heating requirements identified off-site to date as being potentially available, heat could be supplied in the form of hot water. The temperature of the water would be supplied at over 100^{o}C depending upon the end user's requirements.

8.4.2 Initial collection of the hot water would be within the Energy Recovery Building associated with the proposed ATT plant. It would be pumped continuously (24/7) via pre-insulated steel Flow & Return pipes to an Energy Centre which is proposed within part of the building containing the 'fuel preparation facility'.

8.4.3 The Energy Centre would comprise a heat buffer / accumulator which will store hot water before feeding, via a series of pumps, the main district heating circuits (described below). It would also include three gas fired back-up boilers which would allow for the continued export of heat in the event of a heat export failure from the proposed ATT plant.

8.4.4 For the purposes of the ES, it has been assumed that the heat pipe network would be based around four initial circuits, each with the potential for an future extension, these are:

1. To Langlee housing (Hawthorn Road, Broom Drive, Primrose Bank, Marigold Drive) with the potential for an extension loop to housing at Beech Avenue, Laurel Grove and Larch Grove to the west);
2. To Netherdale, via Langlee Drive and Woodstock Avenue to Dale Street and High Mill, Borders College (with the potential for an extension later to Heriot-Watt University Residences at Tweed Street);
3. To Melrose Gait, immediately south of the facility, primarily supplying the affordable housing to be provided in phases by local Registered Social Landlords (RSLs); and
4. A further route north / east to serve the proposed horticulture polytunnels and wood drying developments.

8.4.5 Heat would be distributed to the network in buried pipework. Pre-insulated steel pipes would be used to supply pressurised hot water to the customer, and to return cooler water. Where pipes are small, two pipes may be integrated within a single insulation sleeve. However, single pipes are likely to be used to meet large heat demands. This technology is well proven and provides an energy distribution system with a circa 30 year design life. Additional pipe work can be added in the future and it is a straightforward process to add branches to serve new / additional developments. The anticipated pipe sizes for each district heating loop are provided in Table 8.1 below.

Table 8.1: Proposed Sizing of Heat Pipes

Circuit	Pipe Diameter	Type / Remarks
Main feed from and return to ATT plant to District Heating Energy Centre	300 mm internal Diameter x 2	Bonded pre-insulated steel
Main circuit loops	200 mm internal diameter	Pre-insulated steel or HDPE
Street loops	100 mm internal diameter	Pre-insulated or HDPE
Feeds to Individual house / flat feeds / cul-de-sac etc	75 mm internal diameter	Pre-insulated or HDPE

8.4.6 With regard to institutional / commercial users, heat would be supplied to a secondary heat exchanger on a consumer's premises. Typically, the hot

water in the distribution system is supplied to one side of a heat exchanger at the end user, with the other side arranged to heat up the hot water required by the user. This heat exchanger can be arranged upstream of any back up boiler plant, so that the heat from the facility can top up any heat from the boiler.

8.4.7 In terms of residential premises individual connections would be provided via an individually metered Hydraulic Interface Unit (HIU) which would perform the function of either a combi-boiler or would be connected directly to the existing hot water cylinders.

8.4.8 Water would be pumped continuously around the system. Pumps are operated with 100% standby capacity to maintain heat in the event of a pump fault. The pumps would have variable speed drives to minimise energy usage. Booster pumps can be installed within the distribution pipe network to increase the distance over which the energy can be delivered. Providing the system design pressure is not exceeded then there is no limit as to the distance the water can be pumped. Heat exchangers / further accumulators / buffers can be used to provide pressure breaks to enable the network to be extended.

8.4.9 The heat off-take pipes would generally be buried within trenches located within the confines of the public highway, private roads, or other areas of hardstanding e.g. car parking areas. The only exceptions to this would be:

- A trenchless excavation (using directional drilling) would be utilised for the link between Woodstock Avenue and Dale Street / High Mill, together with the link between the agricultural land and Heather Court / Hawthorne Road; and
- The trench / connection between the waste complex and the aforementioned trenchless excavation would be within agricultural land.

8.4.10 The potential heat pipe network route is shown in Figure 8.2. A graph showing how the district heating network is anticipated to operate on a typical day is provided in Figure 8.3.

Construction Methods

8.4.11 The heat pipes would be buried within a trench would be excavated to a depth of approximately 1m and would be approximately 1.35 m in width.

8.4.12 Pipe supports would be installed within the bottom of the trench, prior to the placement of the steel pipe. The pipes would then be lifted and positioned in the trench by an excavator. Once placed in the trench the pipes would be welded and jointed. Following installation of the pipework the trench would be backfilled with sand to cover the pipes, the trench would then be backfilled with excavated material and the road surface, hardstanding or agricultural land would be reinstated (as appropriate).

8.4.13 During the trenching a working area of approximately 3-4 m in width would be required for the operation of machinery and temporary storage of excavated material prior to backfilling. As such, where works are carried out on a public highway (which would apply to the majority of the works) appropriate traffic management (e.g. temporary traffic lights) would need to be put in place.

8.4.14 As noted above, it would be necessary for a section of the cable route to be constructed using directional drilling. This method is specifically proposed

1. To avoid open excavation within the woodland located to the immediate east of Heather Court / Hawthorne Road; and
2. To avoid any impact upon the Gala Water SAC.

8.4.15 The indicative timetable for the construction of the plant and heat network is provided in the Heat Plan Report.

8.5 Assessment of Likely Significant Environmental Effects

8.5.1 As noted within the proceeding text, there a number of elements associated with the proposed district heating network and electrical cabling route, which can be summarised as follows:

- The vast majority of the cabling / pipe routing would be installed within metalled highways or other hardstandings;

- There would be a requirement for three trenchless excavations (utilising directional drilling). Two under Cala Water (one in connection with the route of the proposed electricity cabling and the other the heat pipe) and one under an existing woodland to the east of Heather Court / Hawthorne Road;
- The trench between Langshaw Road and the trenchless excavation on land to the east of Heather Court / Hawthorne Road would be within existing agricultural land; and
- The construction of a new sub-station in the site of the ATT plant and a new switching station in an appropriate location near the roundabout junction of Tweed Road and Winston Road.
- The proposed Energy Centre Contained within the building associated with the Fuel Preparation facility.

8.5.2 In order to understand the likely impacts associated with the aforementioned grid connection and heat pipe installation works, an appraisal of the proposals in connection with each relevant environmental assessment topic area has been undertaken. The findings are summarised in Table 8.2 below.

8.5.3 It should be noted that the assessment has not included the proposed Energy Centre on the basis that it is to be contained within a building and thus any environmental impacts are or can readily be mitigated.

Table 8.2: Assessment of Environmental Impacts Associated with the Grid Connection and Heat Pipe Installation Works

EIA Topic	Assessment of Effects	Mitigation Measures
Traffic and Transport	The main traffic and transportation effects that could result from the two route options are: • Construction traffic on the local highway network associated with staff movements, the export of material excavated and the general movement of construction plant along the proposed route; and • Potential road closures. Only a small number of construction staff would be required to construct either route. The numbers of construction staff would be insignificant and as such, there is not anticipated to be any significant traffic impacts would occur. The volume of soil requiring export from the routes would be limited due to the fact that much of the material would be re-used in reinstatement works. In relation to export of excavated materials (from activities like the directional drilling) it is considered unlikely that the works would generate more than one / two HGV movements per day. As such, this would not represent a significant traffic impact. During the trenching works sections of the highway that would be the subject of excavation would be closed to traffic. However, the highways along the trench routes are considered to be of sufficient width to enable a single flow of traffic to be maintained during the trenching works. As such, a traffic light controlled system would operate for the period of the temporary works to manage traffic movements.	Temporary traffic control measures would be developed in liaison with Scottish Borders Council Transport and Streets, the Local Highway Authority. Appropriate signage would be installed in advance of the works to inform local road users of the planned date and duration of the works. If deemed necessary, further trenchless excavations (directional drilling) could be employed where a cable route crosses a major intersection.
Landscape and Visual	All of the trenching works and trenchless excavations would be temporary and underground and would not result in any significant landscape or visual impacts. The breaking of road surfaces and the digging of trenches on agricultural land to install the cabling / pipework would be visible locally from along the length of the route. However, only short stretches of the route would be affected at any one time. Moreover, this type of operation is not unusual and visual effects arising would be very short-term in duration and as such, the impact is considered to be negligible. The proposed electrical sub-station on the site of the proposed ATT plant would be a very minor structure and would only ever be seen in the context of the much larger structures associated with the proposed ATT plant and associated fuel preparation facility. On the basis that these structures have been considered to give rise to no significant landscape or visual effects (see Chapter 5.0 for further details), it is not considered that the addition of the sub-station would give rise to anything other than negligible impacts. The proposed switching station within Galashiels would be in a typical street works cabin which would be seen within the existing street scene. Assuming that it is appropriately sited and designed, it is not considered that such a	None considered necessary.

EIA Topic	Assessment of Effects	Mitigation Measures
	typical element of street furniture would give rise to any unacceptable landscape or visual effects. In light of the above, it is not the considered that the proposed routes and associated infrastructure would lead to significant landscape or visual impacts.	
Ecology and Nature Conservation	There is only one statutorily designated site on the proposed routes, which is the Special Area of Conservation (SAC) associated with the Gala Water (a tributary to the River Tweed). There will be a requirement for both the district heating network and the electricity cable network to cross this feature. It is proposed that the both the heat pipe network and electricity cable would cross the watercourse using directional drilling techniques. The use of directional drilling would ensure that the installation of the pipework would have no direct or indirect effects upon the SPA and as such, the impact on this feature is considered to be negligible. There is a requirement for a circa 350m long part of the trench associated with the district heating network (between Langshaw Road and Heather Court / Hawthorne Road) to cross an agricultural field which is currently used for grazing / pasture. The areas of the field that are likely to exhibit the highest ecological value are the field boundaries and there is a hedgerow running along the boundary with Langshaw Road and woodland on the Sothern and western boundaries of the field. Such areas can be used by breeding and nesting birds and can also provide valuable habitats for invertebrates and small mammals. However, the pasture grassland within the central part of the field is currently grazed and is therefore considered to be of very low ecological diversity / value. The proposed route of the trench would enter the field via the existing field gate access on Langshaw Road (directly opposite the entrance to the Easter Langlee waste management complex) and would therefore ensure that there would be no loss of the hedgerow on this boundary. The trenching would then be confined to the central part of the field up to the point it reaches the mature woodland that forms its western boundary. From this point, it is then proposed that the connection between the field and Heather Court / Hawthorne Road be achieved through trenchless excavation (directional drilling) in order to avoid any potential environmental impact on the adjacent woodland and / or any ecological resource that it could support. The directional drilling would also be at a suitable depth to prevent any material effects upon tree roots. As a consequence, the proposals would only result in the temporary loss of some grazed pasture that is considered to be of little ecological value. Accordingly, it is considered that the ecological impact of the pipe route would be at very worst of minor impact, but in all probability would be of negligible impact. With regard to the proposed sub-station at the ATT plant, as set out within Chapter 2.0 of this ES, A comprehensive Ecological Impact Assessment (EcIA) was carried out in support of the planning application for the consented waste facility at Easter Langlee. The assessment drew a number of conclusions regarding the potential impacts of the proposed development which comprise:	Trenchless Excavation techniques should be adopted to prevent impacts occurring to the Gala Water SPA and the woodland to the East of Heather Court / Hawthorne Road. If major structural roots are identified during excavation hand excavation should be undertaken to avoid damage to the roots.

EIA Topic	Assessment of Effects	Mitigation Measures
	• The proposed development site is not ecologically sensitive; • The development would not adversely affect either the River Tweed SAC/SSSI or the Avenel Hill and Gorge SSSI; • The EcIA identifies evidence of badger and otter activity in the area but confirms that the development would not adversely impact upon either; • Woodland to the south west is suitable for red squirrel and nesting bird opportunities exist in the area. However, no effects would occur if good practice measures are followed, this includes the carrying out of construction works outside of the breeding bird season. • Woodland planting proposed to the south would provide opportunities for habitat enhancement • If a scheme of mitigation measures, set out in the EcIA, is carried out there should not be any significant or adverse effects upon the ecological resource. It is anticipated that the proposed ATT plant and the proposed sub-station would be developed on part of the development platform proposed for the consented waste facility. Accordingly, it would not give rise to any greater potential for direct or indirect effects on the local ecological resource. Thus, it is not considered that the proposed sub-station would give rise to any significant effects upon the ecological / nature conservation resource in the vicinity of the application site. With regard to the development activity that would take place within existing highways or other hardstanding (the majority of the trenching and installation of the switching station) they would not result in the loss of any habitats of value. However, there are a number of mature and immature trees (and other vegetation) alongside the proposed trenching routes. Whilst the impacts are unlikely to be significant and none of the trees would be lost as a result of the excavation works they could result in damage to roots and appropriate (standard) mitigation measures would need to be adopted during the construction of the trench to prevent any significant effects occurring. In light of the above, it is considered that subject to the implementation of the suggested mitigation measures, the overall impact on the local ecological resource would be minor to negligible and would be limited to the construction period. Moreover, there should be no potential for significant effects to occur in relation to the Gala Water SAC.	
Geology, Soils and. Groundwater	With regard to the majority of the trenching and the construction of the two sub-stations, given the shallow nature of the excavations and the routine nature of the works proposed no impacts associated with geology, soils or groundwater are predicted. It is possible that some isolated contaminated ground could be encountered in some parts of the proposed routes as a result of localised pollution events. However, standard construction working methods for the installation of utilities would be followed. This would include a health and safety risk assessment for	A health and safety risk assessment would be undertaken to identify any potential impacts on site operatives from contaminated material. The risk assessment would identify the

EIA Topic	Assessment of Effects	Mitigation Measures
	site operatives. The assessment would identify the requirement for the use of personal protection equipment and would define operating procedures for working within areas of potentially contaminated ground. With regard to the three proposed locations for directional drilling, reference has been made to the Scottish Borders Consolidated Local Plan Proposals Map, the mapping provided by the British Geological Survey and SEPA. This has established that: 1. None of the drilling locations are overlain within an area of sensitive groundwater or a major aquifer; 2. No sensitive geological features have been identified along the routes and they are not within sites designated for their geological importance. In light of the above, it is considered that the proposed directional drilling would have a minor / negligible effect upon the geological / hydrological resource. Throughout the directional drilling process, the volume of mud which returns to the drilling sumps is dependent on the ground characteristics. Given the narrow width of the channel required to accommodate the cables / pipes and the short distance for the drilling to take place, it is not expected that the volume of material would be significant. The sumps would be regularly emptied and any solids and drilling mud arising from the drilling operations would be stored on site temporarily in containment bunds. The contractor would be responsible for testing the waste mud to classify it as hazardous or non-hazardous waste as appropriate. Any wastes found to be hazardous, would be stored separately from any non-hazardous stockpiles. If any contaminated material was identified during the excavation works it would be disposed of at an appropriately permitted waste disposal facility. It is considered that the adoption of these mitigation measures (which are based upon standard construction best practice) would prevent any significant effects occurring.	requirement for the use of personal protective equipment by site operatives. If any contaminated material was identified during the excavation works it would be disposed of at an appropriately permitted waste disposal facility.
Surface Waters and Flood Risk	The proposed trenching works would be returned to their previous state once the cable / pipe has been laid. As a consequence, neither of the potential routes is likely to result in an increased flood risk as a result of the loss of floodplain, increased flows of surface water runoff, or by affecting transmission of surface water flows during flood events. Whilst the proposed electrical cabling route would include the development of two sub-stations, these are very minor developments with a very small built footprint and neither would be located within an area that is within the floodplain (as identified by SEPAs Indicative River & Coastal Flood Map). In addition, both would either be constructed upon existing hardstanding areas, or the development platform associated with the proposed ATT plant.	Best practise measures would be adopted during the excavation works in line with CIRIA C532 Control of water pollution from construction sites.

EIA Topic	Assessment of Effects	Mitigation Measures
	Accordingly, neither would be at risk from flooding, nor be likely to materially increase the risk of flooding elsewhere. In light of the above, it is considered that the potential impacts of the proposals in relation to flood risk would be minor / negligible. The construction works would involve the excavation of soils and use of plant and machinery and as such, there is the potential for surface water pollution from suspended sediment, oils, lubricants or fuels. Whilst both route options would involve the crossing of the Gala Water the use of directional drilling techniques would ensure that there would be no direct impact on the watercourse. Nonetheless, given the proximity of some of the works to the watercourses and in particular the River Tweed, standard construction mitigation measures would be implemented to avoid pollution of surface water resources e.g. appropriate storage of fuels and oils. It is considered that through the implementation of the mitigation measures impacts upon water quality as a result of the works would be negligible.	
Noise and Vibration	Sources of noise that may arise from the construction works include mechanical excavators, road breakers with air compressors, mechanical road saws, tipper trucks with grab buckets, directional drilling equipment, other general site vehicles and portable power generators for traffic control signals. The proposed works would be carried out in close proximity to residential properties, but would be similar in nature to standard road maintenance activities or replacement / repair of other utilities and no abnormal noisy operations such as piling are proposed. The proposed works would be undertaken during the day time within areas with elevated background noise levels associated primarily with existing road traffic. Furthermore, the proposed works would only be temporary in nature. The application of best practice attenuation measures in accordance with BS5228 (2009) would assist in significantly reducing any impact (i.e. using equipment that is regularly maintained and where practicable using equipment that is fitted with silencers and hoods). On the basis that the construction works would be temporary, carried out during the daytime, within areas where receptors are likely to experience elevated noise levels and would be carried out in accordance with best practice in accordance with BS5228 (2009), it is considered that the effects would be minor. Thus, no significant effects are predicted in respect of noise disturbance to residential properties.	Working hours would be controlled and noise attenuation measures would be applied at all times to plant and equipment to follow industry best practice and conform to BS 5228.

EIA Topic	Assessment of Effects	Mitigation Measures
	No significant sources of vibration are anticipated in association with the construction methods proposed for either route connection.	
Air Quality	The excavation of trenches would have the potential to give rise to the release of fugitive dust during dry and windy conditions. However, given the minor scale of the works such impacts would not be significant and are unlikely to have any adverse effects on residential or ecological receptors. As such, no significant impacts on air quality are predicted.	No mitigation measures are proposed.
Archaeology and Cultural Heritage	A review of various heritage records held by Heritage Scotland, Canmore and the PASTMAP website was undertaken in respect of the proposed routes. This involved reviewing online statutory designations (Scheduled Monuments, Listed Buildings, World Heritage Sites) and registered receptors (battlefields, parks & gardens). There are no World Heritage Sites, Listed Buildings or registered battlefields or parks & gardens directly on the line of either connection routes. However, there is a single Scheduled Monument on the likely route of the proposed electricity cable, which is the road bridge carrying Winston Road over the former Edinburgh To Hawick Branch Railway. It is not considered that the laying of an electrical cable within the road surface over the bridge would cause any significant effects upon the monument. In addition, it is also understood that the bridge will be undergoing significant modification (including the laying of a new road) as part of the on-going Borders Railway project, which is due to be completed in the summer of 2015. In light of this, it is considered that the proposals would only have a minor / negligible effect upon this feature. 5 listed buildings, all of which are Category B or C listed, have been identified along the proposed routes. On the basis that the construction works would be temporary in duration and would involve activities often experienced along major road corridors, no permanent indirect effects on setting are considered likely to arise. With regards to buried archaeology, a number of features are recorded within Galashiels. However, none are on or within close proximity to the proposed pipe / cable routes. In terms of the potential effects upon buried archaeology, it must be noted that the majority of the works would be within the existing highways boundary and would take place at similar depths to other utility runs located along the highway. The land adjacent to and within the highway is likely to have suffered previous disturbance as a result of the existing road construction. Whilst there would be some potential for the survival of buried archaeological remains the likelihood is considered to be very low. The only area where this would not be the case is the circa 350m trench between Langshaw Road and Heather Court / Hawthorne Road which would be within an agricultural field. However, it must be noted that the field has been the subject of past agricultural activity, which will have included extensive ploughing. Therefore, given the depth of the proposed	No specific mitigation measures are proposed. However, an archaeologist should be present during the excavations on the existing agricultural land. In addition an archaeologist should be brought to site in the event that any identifiable remains are discovered.

EIA Topic	Assessment of Effects	Mitigation Measures
	trench for the pipework (circa 1m depth), it is unlikely that any further disturbance would occur over and above that associated with past agricultural activities. Notwithstanding, it is recommended that a suitably qualified archaeologist is present during these works and in the unlikely event of any identifiable remains being found, works would be halted whilst they are investigated. In light of the above, it is considered that the potential impacts of the options on below ground archaeological resources would be minor.	

8.6 Summary and Conclusions

8.6.1 The grid connection / heat pipe network and associated infrastructure (including the Energy Centre planned within the fuel preparation facility) does not form part of the planning application for the ATT plant and would be authorised by either a separate planning application, or through permitted development rights. However, on the basis that export of energy (heat and electricity) is an integral part of the scheme, it is considered appropriate that the potential environmental impacts associated with the delivery of the heat pipe network are assessed within the ES.

8.6.2 This Chapter has provided a description of the most likely route options for both networks and the anticipated methods that would be adopted during their construction. Based upon this information, an assessment has been undertaken to provide an appraisal of the likely environmental effects of both networks.

8.6.3 The assessment has concluded that no significant residual adverse impacts are likely to arise from the construction or operation of either the proposed grid connection or heat pipe installation works. Where any potential environmental effects have been identified, appropriate mitigation measures have been proposed to avoid or reduce these impacts.

9.0 SUMMARY OF EFFECTS

9.1 Introduction

9.1.1 This chapter of the Environmental Statement (ES) provides a summary of the assessment of the likely environmental effects that may arise from the construction and operation of the Easter Langlee ATT plant development.

9.1.2 As noted in Chapter 2.0 of the ES the application site already benefits from planning permission for a waste management facility and the proposed ATT plant would replace infrastructure proposed in connection with the consented facility.

9.1.3 The proposed ATT plant would share infrastructure with the consented waste facility and also result in other environmental benefits. In particular the ATT plant would:

- Be developed on the same development platform as the consented waste facility;
- Comprise buildings that (with the exception of a 23m high exhaust) are not materially different in terms of their height, scale and massing to those proposed as part of the consented waste facility;
- Not materially alter the extent of hardstanding proposed in connection with the consented waste facility;
- Result in a reduction in the number of vehicles required to visit the site when compared to the consented waste facility.

9.1.4 In light of the above, it is considered that the outcome of a number of the assessments carried out in support of the consented waste facility remain valid in the context of the proposed ATT plant and specifically:

- Ecology and nature conservation (with the exception of the potential indirect effects associated with the aerial deposition of pollutants);
- Traffic and Transportation;
- Archaeology and Heritage;
- Ground Conditions / Remediation; and
- Surface Water Drainage and Flood Risk.

9.1.5 All of these assessments concluded that (subject to the implementation of mitigation measures) the consented waste facility would not give rise to any significant environmental effects. The same would therefore also apply to the proposed ATT plant development.

9.1.6 In light of the above, the scope of this ES has been limited to the assessment of the likely significant effects of the ATT plant development in relation to Landscape and Visual effects; Noise; Air Quality and Energy Export Connections. The summary of effects for each of these topic areas is provided below.

9.2 Landscape and Visual Impact

9.2.1 Chapter 5.0 provides an assessment of the landscape and visual impacts of the proposed ATT plant. The methodology used to carry out the assessment is based upon that set out in Guidelines for Landscape and Visual Impact Assessment *'The Landscape Institute and Institute of Environmental Assessment – 1st ed. 1995 and 2nd ed. 2002'*.

9.2.2 The proposed development would result in only minimal change to the landscape fabric of the site when compared to the consented waste facility which would primarily be associated with a very minor change in the footprint of the development and the loss of some landscaping proposed in connection with the development. Accordingly, effects upon the landscape fabric would not be significant in Environmental Impact Assessment (EIA) terms.

9.2.3 The proposed buildings would not be appreciably different in size or scale than the buildings associated with the consented waste facility and as such, their influence upon the surrounding landscape would be no different. The presence of the proposed exhaust would introduce a new element. However, existing vertical features (pylons) are present in the immediate surroundings of the site and thus the change in character would be negligible. In light of this, the effects of the ATT plant development upon landscape / townscape character would not be significant in EIA terms.

9.2.4 Visual effects have been assessed from 5 viewpoints, including the residential properties that are currently being developed to the south. In addition assessment has also been made of the visual effects of the ATT plant development upon the wider pattern of views in the area and during night-time period. In all cases the assessment has concluded that the effects of the proposed ATT plant development would be either negligible or minor and as such, would not be significant in EIA terms.

9.3 Noise and Vibration

9.3.1 Chapter 6.0 provides an assessment of the noise and vibration impacts of the proposed ATT plant. To establish any likely impact from noise a baseline noise survey carried out in support of the planning application for the consented waste facility were utilised to establish the existing noise climate at the site. Relevant and appropriate noise guidance and standards have been used to determine the potential noise impact from the proposal. Impacts from both the construction and operational phases of the proposed ATT plant development have been assessed.

9.3.2 The matter of construction noise was assessed in the noise assessment associated with the consented waste facility at the site. This confirmed that the noise associated with the construction of the facility is unlikely to be significant due to the separation distance between the site and the nearest noise sensitive receptors. It also concluded that, effects during the construction phase would generally only occur during the daytime and would be temporary in duration.

9.3.3 It is not considered that the construction methods that would be adopted in connection with the proposed ATT plant development would be materially different to those associated with the consented waste facility and as such, these conclusions (i.e. no significant effects) should also apply to the proposed development.

9.3.4 In addition to the above, and in accordance with BS5228, it is also important to note that best practical means would be employed to control the generation of noise during the construction phase which would further

assist in preventing any potentially significant effects from occurring as a result of construction activities.

9.3.5 With regard to the operation of the proposed ATT plant, the assessment has established that the main sources of noise would be:

- Noise generated by the 23m high exhaust; and
- Noise break-out from the south, east and west facades of the fuel preparation facility and the buildings associated with the proposed ATT plant.

9.3.6 A number of noise control measures are proposed in order to address these issues which include the use of gas engine exhaust silencers, acoustic plenum / plena and acoustic insulation within the proposed building fabric.

9.3.7 With the recommended noise control measures implemented it has been found that the level of significance of the noise impact on the nearest NSRs during the operational phase would not be any greater than 'Neutral / Slight' or 'Slight' when assessed in terms of the guidance set out within PAN/2011 TANAN. A 'Slight' level of significance is considered in PAN/2011 to be *"unlikely to be of importance in the decision making process"*. In light of this, it can be concluded that the potential noise impact of the proposed development would be acceptable at the nearest NSRs and would not be significant in EIA terms.

9.3.8 In terms of ground-borne vibration, it has been assessed that a combination of the distance between the works and receptors (circa 180m to the nearest receptor) and the adoption of best practicable means, should ensure that no significant effects would occur as a result of vibration during the construction phase.

9.3.9 Based on the findings of the noise assessment carried out in support of the consented waste facility, operational vibration is considered to be negligible at this stage. However, it is recommended that this is reassessed during the detailed design stage to ensure that the normal operations of the proposed new development would not cause any adverse impacts on vibration sensitive receivers.

9.4 Air Quality

9.4.1 Chapter 7.0 provides an assessment of the air quality impacts of the proposed ATT plant development. The assessment has identified that the operation of the facility would give rise to a number of substances that would be emitted into the atmosphere and primarily oxides of nitrogen, (which have been the focus of the assessment). The potential environmental effects of these emissions have been assessed using detailed air dispersion modelling. The results of the modelling have been assessed against relevant objectives and guidelines identified from national legislation and Scottish Environmental Protection Agency (SEPA) guidance documents.

9.4.2 The assumptions that have been adopted to determine the predicted emission levels from the facility, i.e. maximum ground level concentrations and background levels in the vicinity of the facility, have all been based on a 'worst-case' scenario.

9.4.3 The impact of construction phase activities has been addressed using the IAQM recommended methodology based on the risk of the site giving rise to dust and sensitivity of the surrounding area. With the implementation of suitable mitigation measures, such as a Construction Environmental Management Plan (CEMP) based on measures outlined within the Mayor of London's Best Practice Guidance *"The control of dust and emissions from construction and demolition*", the significance construction phase dust and traffic emissions is predicted to be negligible.

9.4.4 On the basis that there is predicted to be a reduction in odour emissions with the ATT plant in place, there would be no change in the conclusions from the assessment for the consented scheme in this regard and thus effect of odour would be negligible.

9.4.5 Emissions of oxides of nitrogen from the ATT plant exhaust would not affect the achievement of the relevant air quality strategy objectives and critical levels for human health or vegetation. Total ambient concentrations of nitrogen dioxide would remain well below the long-term national Air

Quality Strategy (AQS) objectives at the nearest residential receptors, including at the new residential development that is being constructed to the south of the site. In addition, the operation of the development would not lead to any exceedences of the short-term national air quality criterion at any location in the surrounding area. Furthermore, the effect of the facility in terms of oxides of nitrogen concentrations and nitrogen deposition rates at designated ecological sites in the area is not considered to be significant.

9.4.6 The potential cumulative effects of the proposed ATT plant when operating concurrently with the adjacent fuel preparation facility would not result in any change in the conclusions of the assessment, either in terms of human health or ecology.

9.4.7 In summary, the impact of the proposed facility is not considered to have a significant impact upon local air quality, the general population, the local community or potentially sensitive ecological receptors.

9.5 Energy Export Connections

9.5.1 Chapter 8.0 provides an assessment of the proposal in relation to energy export connections.

9.5.2 The grid connection / heat pipe network and associated infrastructure (including the Energy Centre planned within the fuel preparation facility) does not form part of the planning application for the ATT plant and would be authorised by either a separate planning application, or through permitted development rights. However, on the basis that export of energy (heat and electricity) is an integral part of the scheme, it is considered appropriate that the potential environmental impacts associated with the delivery of the heat pipe network are assessed within the ES.

9.5.3 This Chapter provides a description of the most likely route options for both networks and the anticipated methods that would be adopted during their construction. Based upon this information, an assessment has been

undertaken to provide an appraisal of the likely environmental effects of both networks.

9.5.4 The assessment has concluded that no significant residual adverse impacts are likely to arise from the construction or operation of either the proposed grid connection or heat pipe installation works. Where any potential environmental effects have been identified, appropriate mitigation measures have been proposed to avoid or reduce these impacts.

9.6 Summary

9.6.1 In considering the results of this ES, it can be concluded that the proposed development would provide a sustainable waste management solution for the management of residual municipal waste arising within the SBC's administrative area, assist in diverting waste from landfill, generate realistic opportunities for the development of a district hearting network within Galashiels, provide a source of low carbon and renewable energy and create new job opportunities.

9.6.2 The assessments contained within this ES have demonstrated that no significant residual adverse environmental impacts have been identified.

Figures

Technical Appendices

Appendix 2-1

EIA Screening request to SBC dated 3rd August 2012

Appendix 2-2

Scottish Borders Council EIA Screening Opinion dated 28th August 2012

Appendix 2-3

Ecological Impact Assessment carried out in Support of the Consented Waste Facility (RPS 22nd February 2011)

Appendix 2-4

Transport Note prepared in Support of the Consented Waste Facility (RPS 22nd February 2011)

Appendix 2-5

Archaeological Written Scheme of Investigation and Archaeological Assessment carried out in Support of the Consented Waste Facility (Kirkdale Archaeology 15th June 2011 & 8th August 2011)

Appendix 2-6

Information Submitted Pursuant to the discharge of Conditions 8 and 9 attached to the Planning Permission for the Consented Waste Facility

Appendix 4-1

Relevant European, National and Local Planning Policy and Guidance of Relevance to the Proposed ATT Plant

Appendix 5-1

Landscape and Visual Impact Assessment Prepared in relation to Consented Waste Facility (RPS, 31 January 2011)

Appendix 5-2

Guidelines for Landscape and Visual Assessment 3 – Transitional Guidance

Appendix 5-3

Aftercare and Management Strategy Prepared in relation to Consented Waste Facility (RPS, 12 September 2011)

Appendix 6-1

Noise and Vibration Assessment Prepared in Support of the Consented Waste Facility (RPS 21st February 2011)

Appendix 6-2

Basic Acoustic Terminology

Appendix 6-3

ISO1996-2: 2007 Tone Audibility Objective Assessment Method

Appendix 6-4

Noise Model

Appendix 7-1

Air Quality Assessment Prepared in Support of the Consented Waste Facility (RPS 22nd February 2011)