MVV Environment Services Ltd

Energy from Waste Combined Heat and Power Facility, Forties Road, Dundee

Information to Inform a Habitat Regulations Assessment

245510-05/S001

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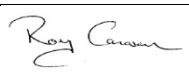
		Signature			
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Appendices

Executive Summary

This report presents an update to the results of the HRA screening and Appropriate Assessment exercise undertaken as part of the Environmental Statement (ES) prepared in support of planning application 16/00916/FULM for the proposed Energy from Waste (EfW) Combined Heat and Power (CHP) Facility, Forties Road, Dundee, which was submitted by MVV Environment Ltd. to Dundee City Council (DCC) on 8 November 2016.

Under Condition 17 of Planning Permission 16/00916/FULM, the proposed EfW CHP facility was to replace the existing EfW facility (formerly known as DERL), with minimal operational overlap between the facilities. MVV Environment Baldovie Ltd (MEB) is seeking permission to vary Condition 17 of Planning Permission 16/00916/FULM and paragraphs 2.9.8 and 2.9.9 of Permit No: PPC/A/1003157 (as varied; issued by SEPA on 28 February 2019) to allow for parallel operations of both facilities for a period of up to 10 years, commencing in April 2020.

As agreed with DCC, the ES, and all supporting documentation, including this HRA, has been updated to assess parallel operations only, with no revisions made to the construction impact assessment. Therefore, the following should be noted:

1. Construction commenced in January 2018 and first firing on waste is scheduled to commence by the end of March 2020.
    a. The construction assessment has not been reassessed, however, has been restructured to align with the new 'People over Wind' case law (Section 1.1). Mitigation is now discussed within the Appropriate Assessment;
    b. The Outer Firth of Forth and St Andrews Bay Complex proposed Special Protection Area (pSPA) was identified by the Scottish Government as a pSPA after planning application 16/00916/FULM was submitted in November 2016, therefore this site has been included in both the construction and operational assessment. The addition of this pSPA has not changed the overall construction assessment conclusion;
2. All updates to the ES, including this HRA, are highlighted in yellow with all removed text shown with a ~~strike through~~;
3. In the part of the ES which did not require updating, the existing EfW facilities are referenced as the Dundee Energy Recovery Ltd (DERL) facility. It was renamed to MVV Environment Baldovie (MEB) in 2017;
4. Where the ES has been updated, the existing EfW facility is referred to by its new name of MEB and referred to as the existing EfW facility. The new facility, which is under construction, is referred to as the EfW CHP facility;
5. Michelin is scheduled to close; however, it is currently operational. The pipeline between the two facilities has been constructed, however, the

connections have not been made. As the site is currently operational, it has been assumed that the facilities will supply steam to Michelin for the purposes of this assessment. In addition, there is the potential to supply energy to future developments as outlined below.

a. A statement was released on 6 November 2019 stating that "The Dundee's Michelin site has received a £60m funding commitment to turn the former plant into an innovation centre. The new centre will focus on sustainable mobility, clean transport and low carbon energy. Michelin Scotland Innovation Parc (MSIP) will be created over the next decade. The investment is supported by Michelin, Scottish Enterprise and DCC. The new centre will include office space, with an "innovation hub" for collaborations between industry and academia."

b. MVV is in discussion with parties involved in developing Michelin Scotland Innovation Parc (MSIP) with the objective of delivering energy from the EfW CHP Facility to MISP.

6. The Applicant of the original planning application made in November 2016 was MVV Environment Services Ltd. MVV Environment Ltd are operating the EfW facility and constructing the EfW CHP facility on the adjoining land through their wholly owned subsidiary MVV Environment Baldovie Ltd (MEB). The Applicant for the application to vary Condition 17 of Planning Permission 16/00916 to allow for parallel operations is, therefore, MEB. As the ES has been updated to assess parallel operations only, reference to the Application has remained as MVV throughout.

~~This report details the results of the HRA screening and exercise undertaken in relation to proposals to construct a new Energy from Waste Combined Heat and Power (EfW CHP) facility at Baldovie Industrial Estate, Forties Road, Dundee.~~
Key results of the HRA screening and Appropriate Assessment exercise include:

- Five European sites and one proposed European site are located within 15km of the proposed site. These include Firth of Tay and Eden Estuary SAC, Firth of Tay and Eden Estuary SPA and Ramsar, Barry Links SAC, River Tay SAC and the Outer Firth of Forth and St Andrews Bay Complex pSPA
- Potential indirect impacts associated with air pollution and deposition as a result of the Project once in operation on the six ~~five~~ listed European sites were identified.
- Potential indirect impacts associated with runoff and pollution as a result of the Project construction were identified at the Firth of Tay and Eden Estuary SAC, Firth of Tay and Eden Estuary SPA and Ramsar and the Outer Firth of Forth and St Andrews Bay Complex pSPA. These impacts were further assessed in the Appropriate Assessment. With the implementation of the CEMD, these potential indirect impacts were scoped out.
- The results of the air quality modelling were used to determine if the Process Contribution as a result of the Project is likely to have a significant impact on European sites. This was undertaken using the published Critical Levels and Critical Loads for the most sensitive qualifying SAC, SPA, pSPA and Ramsar features.

- The results of the air quality modelling showed that there are no direct impacts predicted from air quality concentrations (pollutants NOx, SO_2, NH_3 and HF), to any of the six European designated sites or their conservation objectives.
- The results showed that, currently, the operating existing EfW facility is predicted to exceed the 70% PEC Critical Level threshold for the maximum 24 hour mean at the Fithie Burn receptor site (72.1% PEC). With the dual operation of the existing EfW facility and the EfW CHP facility, the NOx 24 hour mean PEC is predicted to rise to 77.1%. With regards to annual mean NOx, the results showed that the 70% PEC threshold at the Fithie Burn receptor site is predicted to be met through operating the existing EfW facility in isolation (56% PEC). With the dual operations however, this predicted in annual mean NOx to rise to 71.7% PEC of the EAL. The results also showed that all other ecological receptors (including European designated sites) identified within the Air Quality Assessment were predicted to be well below the 70% PEC threshold for all pollutants.
- It is not considered that the slight increase in both annual mean and 24 hour mean NOx from this single tributary will have a material impact on any of the conservation objectives of the European designated sites
- ~~The results concluded that potential impacts at European sites as a result of air pollution emissions from the Project are considered to be negligible and not significant. No significant impacts on qualifying SPA, SAC and Ramsar features associated with the deposition of nitrogen or acidity were identified.~~
- No potential for significant effects in-combination with other projects were identified.
- Consequently, predicted impacts in terms of airborne pollution emissions are not considered to be significant, either alone or in-combination with other Projects. ~~Therefore a Stage 2 Appropriate Assessment is not considered necessary.~~

1 Introduction

Ove Arup and Partners Scotland Ltd (Arup) has been commissioned by MVV Environment Services Ltd (MVV) to prepare an Environmental Impact Assessment (EIA) in support of a planning application for an Energy from Waste (EfW) Combined Heat and Power (CHP) scheme, which is to be located to the east of Forties Road in the Baldovie Industrial Estate, Dundee.

The proposed EfW CHP scheme was identified as a Schedule 2 development under the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2011. It includes the relocation of the existing waste reception and sorting operation associated with the Dundee Energy Recycling Ltd (DERL) site and the development of a new EfW CHP scheme. The development site is bounded to the west by Forties Road and to the east by the existing Michelin factory. (Approximate National Grid Reference NO 44583 32855).

The development proposals will be constructed while the neighbouring DERL site remains operational. Once construction is complete, the existing EfW facility will be remain operational. The two plants will operate in parallel for a period of up to 10 years from April 2020. ~~decommissioned and the proposed EfW CHP scheme will come online. At no point will the two plants operate burning residual waste in parallel.~~

The development proposals will contribute to serving the long term waste management needs of Dundee City Council (DCC) and Angus Council (AC). In particular, the proposals will assist DCC and AC to meet the requirements of the Waste (Scotland) Regulations 2012 which will place a ban on biodegradable municipal waste going to landfill from January 2021, the Scottish Government announced in September 2019 that this will be deferred to 2025

1.1 Purpose of this Report

~~This report provides information to allow the Competent Authority to undertake a screening decision as to whether an Appropriate Assessment, as outlined in the Habitats Directive is required in relation to the proposed development. This report informs the first stage of the Habitat Regulations Assessment (HRA) process to screen for likely significant effects (Section 2.3).~~

This report now comprises both the Stage 1 (Screening) and Stage 2 (Appropriate Assessment) of a Habitat Regulations Appraisal (HRA). The Appropriate Assessment (AA) has been included to reflect the outcomes of the 'People over Wind' case in 2018. This case law states that measures, such as mitigation, intended to avoid or reduce harmful effect of a proposed project on a European site should no longer be taken into account by competent authorities at the HRA Stage 1 (Screening) when judging whether a proposed plan or project is likely to have a significant effect on the integrity of a European designated site. This report has been prepared to inform the 'competent authority', about the implications of the proposed development on nearby European sites, as required under Regulation

48 (1) of the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended in Scotland) (hereafter referred to as the 'Habitats Regulations'). It has been prepared in accordance with the Habitats Regulations.

The report identifies if there are any likely significant effects of the Project on European sites and features, either alone or in-combination with other plans or projects, in light of their conservation objectives, as required under the Habitats Regulations. Potential impacts on ecology that may arise from the Project are also assessed in Vol 2 Section 4 (Ecology) of the Environmental Statement (ES)[1]. This report should be read alongside the supporting documents prepared as part of the ES.

1.2 Report Structure

This report includes:

- Section 2: Legislation and Guidance.
- Section 3: Project Description.
- Section 4: Methodology.
- Section 5: Designated Sites.
- Section 6: Baseline Conditions and Modelling Results.
- Section 7: Appropriate Assessment ~~Assessment of Impacts.~~
- Section 8: Conclusion.

[1] MVV ~~MMV~~ Environmental Services Ltd (2016) 'Energy from Waste Combined Heat and Power Facility, Forties Road, Dundee – Environmental Statement Volume Two.'

2 Legislation and Guidance

2.1 The Conservation (Natural Habitats, &c.) Regulations 1994 (as amended in Scotland)

In Scotland the Habitats Directive is transposed through a combination of the Habitats Regulations 2010 (in relation to reserved matters) and the 1994 Regulations. This transposes the Habitats Directive (Council Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora[2]) into UK law. Regulation 61(1) states that:

"A competent authority, before deciding to undertake, or give any consent, permission or other authorisation for, a plan or project which

(a) is likely to have a significant effect on a European site or a European offshore marine site (either alone or in combination with other plans or projects); and

(b) is not directly connected with or necessary to the management of that site,

must make an appropriate assessment of the implications for that site in view of that site's conservation objectives."

Such an assessment is referred to as a Habitats Regulations Assessment (HRA).

Regulation 61(2) states:

"A person applying for any such consent, permission or other authorisation must provide such information as the competent authority may reasonably require for the purposes of the assessment or to enable them to determine whether an appropriate assessment is required."

European sites, as defined under the Habitats Regulations, are Special Areas of Conservation (SACs) designated under the Habitats Regulations and Special Protection Areas (SPAs). As a matter of UK government policy, sites designated under the Convention on Wetlands 1971 (the Ramsar Convention)[3], known as Ramsar Sites, are also included within the consideration of European sites.

2.2 Guidance Documents

The following guidance documents have also been utilised for the preparation of this report:

[2] European Commission (1992) Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora. Available at: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31992L0043:EN:HTML.
[3] United Nations Educational, Scientific and Cultural Organization (UNESCO) (1994) Convention on Wetlands of International Importance especially as Waterfowl Habitat. Ramsar, Iran, 2.2.1971 as amended by the Protocol of 3.12.1982 and the Amendments of 28.5.1987. Available at: http://www.ramsar.org/sites/default/files/documents/library/current_convention_text_e.pdf.

- 'Habitats Regulations Appraisal - Development Plans: Advice Sheets' published by the Scottish Government (2012)[4]
- 'Guidance for plan-making bodies in Scotland' published by Scottish Natural Heritage (SNH) (2015)[5].

2.3 Process of Habitats Regulations Assessment

Figure 1 provides an overview of the HRA process for projects within or with potential to affect European sites.

[4] Scottish Government (2012) Habitats Regulations Appraisal - Development Plans: Advice Sheets 1 – 3 Available at: https://beta.gov.scot/publications/habitats-regulations-appraisal-development-plans-advice-sheets/.
[5] SNH (2015) Habitat Regulations Appraisal of Plans - Guidance for Plan-Making Bodies in Scotland – Version 3.

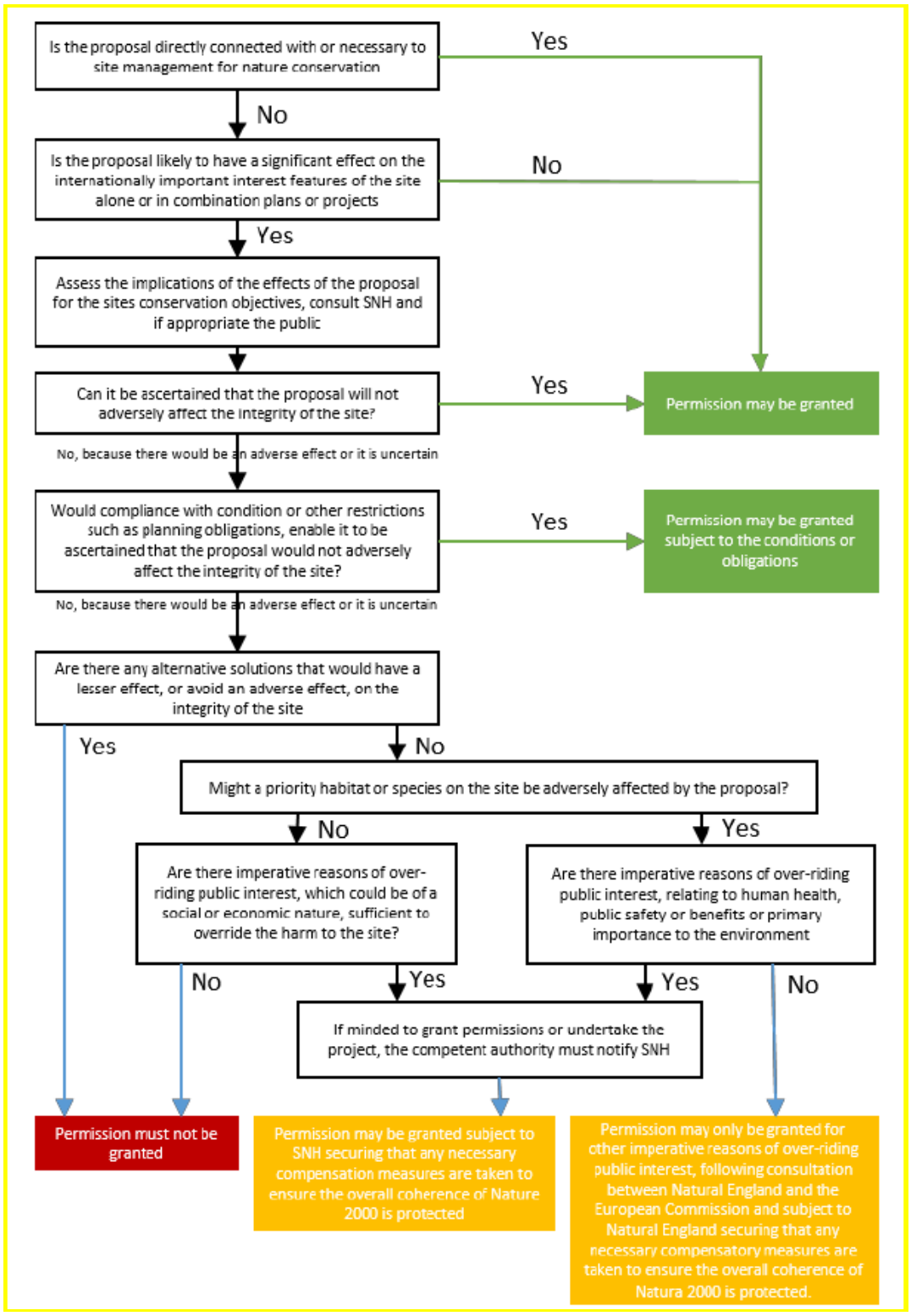

Figure 1: The Habitats Regulation Appraisal Process

Regulation 48 of the Habitats Regulations requires a competent authority to make an 'appropriate assessment' of the implications of a plan or project for that site in view of its conservation objectives, before deciding to undertake or give consent for a plan or project which (a) is likely to have a significant effect on a European

Does this need and (b) is not directly connected with or necessary to the management of that site.

In light of the conclusions of the assessment, the competent authority may proceed with or consent to the plan or project only after having ascertained that it would not adversely affect the integrity of the European site.

All plans and projects should identify any such possible effects early in the plan/project making process and then either alter the plan/project to avoid them or introduce mitigation measures to the point where no adverse effects occur. The competent authority is to agree to the plan or project only after having ascertained that it would not adversely affect the integrity of the site concerned and, if appropriate, having obtained the opinion of the general public.

The assessment of a plan or project under the Habitats Regulations can be split into several sections as shown in Figure 1. There are effectively four stages to the assessment, comprising:

- Stage 1 – Screening: This is the assessment of the likelihood of a plan or project having a significant effect on a European site or its features. This is the trigger for the need for an Appropriate Assessment as set out in Regulation 48 (1). This stage is considered in Sections 4 and 6 of this report;
- Stage 2 - Appropriate Assessment: This is the detailed consideration of the potential effects of the plan or project in relation to the conservation objectives for the European site to determine if there is likely to be an adverse effect on the integrity of the site (i.e. an effect that would compromise the site meeting its conservation objectives). Providing it can be demonstrated that with appropriate mitigation measures the plan or project would not give rise to an adverse effect on the integrity of a European site, the plan or project can proceed. This Stage is considered in Section 7 of this report;
- Stage 3 - Consideration of Alternatives: Where it cannot be demonstrated that the project could give rise to an adverse effect on the integrity of a European site, or there is uncertainty, the assessment would need to consider if there were any other alternatives to the plan or project that would not give rise to adverse effects on the integrity of the European site; and
- Stage 4 – Reasons of Overriding Public Interest: If there are no alternatives, Stage 4 would then consider if there are any imperative reasons of overriding public interest, and whether there were any compensatory measures that might be required.

~~This report comprises stage one of the HRA process, which is screening for likely significant effects on European sites.~~

~~Stage one has not identified any likely significant effects. It is therefore not considered necessary to proceed with further stages in the HRA process, which would be:~~

- ~~Stage two, which involves an appropriate assessment of the implications of the Project on the integrity of European sites;~~

- ~~Stage three, which requires consideration of alternative solutions, applies if stage two concludes that the Project would adversely affect the integrity of these sites, or is inconclusive; and~~
- ~~Stage four, which considers whether the project is justified by Imperative Reasons of Overriding Public Interest and whether compensatory measures are required, applies if there are no satisfactory alternatives.~~

3 Project Description

3.1 The Project

Proposals for the site are to construct a new Energy from Waste Combined Heat and Power (EfW CHP) facility. The primary purpose of the EfW CHP facility is to treat the residual waste from the Dundee and Angus area that has not been recycled, reused or composted. The facility will therefore primarily deal with household waste provided by Dundee and Angus Councils under the Dundee and Angus Residual Waste Treatment Contract. The remaining processing capacity will be used to process similar Commercial and Industrial waste from local businesses in the surrounding area. The proposed MVV Energy from Waste plant will aid in ~~take over the~~ processing of commercial waste collections and house clearances carried out by Dundee City Council which are currently undertaken at the existing ATS plant.

The new facility is to be located on the land between the Dundee Energy Recovery Ltd (DERL) facility and the car breakers to the south. The existing site is currently used for the processing and recycling of material recovered from highway construction and repairs. The new EfW CHP facility will share the existing DERL access road and trafficked areas for operational purposes, as well as share DERL's weigh-bridges, gatehouse and drainage. There will also be some connections to adjacent infrastructure.

The existing EfW facility will be remain operational. The two plants will operate in parallel for a period of up to 10 years from April 2020. ~~The DERL facility is close to the end of its economic life and does not operate in Combined Heat and Power mode. It is therefore proposed to provide a new, efficient facility that~~ The new facility will last for 25 to 40 years and which will also not only manage the residual waste from the Dundee and Angus areas but will also provide a large quantity of energy in an efficient and economical manner to both the potential Michelin Scotland Innovation Parc (MSIP); and the National Grid.

The primary purpose of the EfW CHP facility is to treat the household waste collected by both Dundee City Council and Angus Council which has not been recycled, reused or composted. The proposed replacement facility is designed to treat up to 110,000 tonnes of waste per year and thereby generating 39.9 Megawatts of energy per hour. However, the capacity and output could vary as the nature and calorific value of the residual waste changes over the life of the facility.

Waste received at the site will be managed in an enclosed building with all the malodourous air fed into the boiler which will burn the waste. The boiler will then generate steam which will drive a turbine, generating electricity to power the plant and could then provide steam for the Michelin site. Any excess electricity could be exported to the National Grid. If a heat network is developed in Dundee the excess energy ~~which is not used by Michelin~~ could be distributed to nearby housing and businesses.

3.2 The Applicant

The application for the EfW CHP facility is being made by MVV Environment Services Limited (MVV), a wholly owned subsidiary of MVV Umwelt GmbH. In Germany, MVV Umwelt operate six Energy from Waste and biomass plants, managing 1.6 million tonnes of waste a year. In the UK, MVV already operate an EfW CHP facility in Plymouth, managing the residual waste from south-west Devon and a biomass energy from waste facility in Kent.

3.3 The Site

The planning application relates to five parcels of land and would result in a new layout for the waste management facility covering an area of approximately 0.848 hectares. The application includes the following areas (Figure 3.1):

A. The new Energy from Waste Combined Heat and Power Facility.

B. A Flood Mitigation Area.

C. The existing ATS Site.

D. The construction compound and contractors' parking.

E. The existing Dundee Energy Recovery Ltd Energy from Waste facility (DERL).

The replacement facility will be located adjacent to the existing waste management facilities ~~(DERL)~~. Once the new EfW CHP facility has passed its initial commissioning tests it will begin operation in parallel with the existing EfW facility for a period of up to 10 years from April 2020. ~~all waste will be diverted to it, and DERL would cease to burn waste. At no time would both facilities burn waste simultaneously.~~

Figure 3.1: Site Plan

Energy from Waste Combined Heat and Power Facility (Area A, Figure 3.1)

The proposed EfW CHP facility would be constructed on the Dundee City Council owned site currently occupied by Tayside Contracts who recycle road construction waste and whose activities will relocate to Riverside. The new facility would generate energy using waste as a fuel. Like DERL, the new facility would continue to take waste after it has been sorted by householders to remove recyclable materials, as well as similar waste from businesses, shops and factories.

Preselected Flood Mitigation Area (Area B, Figure 3.1)

To avoid increasing flooding risk, a 'Flood Mitigation Area', will be located to the southwest of the proposed scheme on the south side of the Dighty Water. A shallow depression will be constructed in this area which will reduce the risk of flooding from the adjacent Dighty Water as a result of the new development. However this will not increase the risk of flooding to nearby residents.

Existing ATS Site (Area C, Figure 3.1)

The existing ATS site will continue to be used to treat bulky waste as the new facility is being built. The ATS site managed the residual waste from Dundee from the 1970's, until the DERL facility became operational in 2000. It continues to pre-treat some residual waste and acts as a transfer station for recyclates, a depot for the refuse collection vehicles and parks department, providing garaging, stores and 'messing' facilities.

Existing Dundee Energy Recovery Ltd. Energy from Waste Facility (Area D, Figure 3.1)

The existing DERL facility will continue ~~cease~~ to operate as soon as the proposed replacement facility is commissioned. The access, weighbridges, tipping hall and some electrical switchgear would be retained and used as part of the new facility. The tipping hall will be used for the pre-treatment of bulky waste which currently occurs on the ATS site.

Construction compound and contractor parking (Area E, Figure 3.1)

A temporary construction compound will be established on the land on the west side of Forties Road, opposite the proposed EfW CHP facility. This will minimise disruption of waste deliveries to the existing site and reduce traffic impacts associated with the transportation of construction materials for the new facility.

3.4 Reasons for Site Location

The existing DERL waste management facility is currently owned by Dundee City Council. The facility is close to the end of its economic life but does not operate in Combined Heat and Power mode. It generates electricity but does not provide steam to any industrial premises.

By locating the new facility in an existing industrial area adjacent to the existing DERL, there will be minimum disruption to both local residents and to the existing household waste collection operations in Dundee and Angus. The use of the adjacent site presents the best opportunity to construct a new facility while also allowing the existing DERL facility to continue to operate during the three year construction period. The proposals will also allow some of the existing buildings to be incorporated into the new facility thereby making the best use of existing assets. The proposals could facilitate the future supply of energy to the Michelin site.

~~The applicant has used the Scottish Government's 'Heat Map[6]', to identify the largest heat users in Dundee. There are other areas where the proposed scheme may have been located and which may have also provided energy to nearby users. However, none of these sites are able to provide the opportunity to generate a large quantity of heat in an efficient manner to a key employer such as Michelin. It was on this basis that the site adjacent to the existing waste management facility was identified as the most appropriate site for the provision of the new facility.~~

3.5 Stages of Development

Construction of the proposed EfW CHP scheme is expected to take place between mid-2017 and early 2020 and will take approximately three years to complete. The existing DERL facility will remain operational after the new facility is completed.

[6] Scottish Government (No date) Scotland Heat Map Available at: http://heatmap.scotland.gov.uk/

A temporary construction compound will be established on land to the west side of Forties Road opposite the proposed EfW CHP facility. All construction material will be transferred to and from the application site by road. Construction traffic will access and leave the site via Forties Road and both to and from Drumgeith Road. The number of vehicles will vary during the construction period.

The normal working hours for the construction works will be from 07:00 to 18:00 Monday to Friday and from 08:00 to 13:00 on Saturdays. No work is expected to take place on Sundays, public and local holidays or outside the proposed working hours. Any construction work outside of these periods will only take place if it has been agreed in advance with officers of the city council.

During construction, good practice measures will be followed to ensure that the risk of negative impacts on people and the environment are responsibly managed. A Construction Environmental Management Plan (CEMP) has been developed for the proposed scheme in order to support good practice (Section 3.6).

MVV has recently built a similar facility in Plymouth which is located much closer to houses than the proposed plant in Dundee. MVV will also draw on its experience in keeping construction activities as quiet as possible and to minimise any disturbance from traffic, dust and lighting, in order to reduce the impact on nearby residents.

3.6 Construction Environmental Management Plan (CEMP)

The following construction measures form part of the Project and are incorporated in the Construction Environmental Management Plan (CEMP)[7] developed for the scheme:

- Industry best practices will be used to control dust emissions, noise levels, vibration and lighting during construction. This will include implementation of mitigation measures to ensure effective control of dust emissions, noise, vibration and lighting from the construction works in accordance with industry standards. Ongoing monitoring programmes to ensure the adequacy of the mitigation measures being employed will also be implemented for the duration of construction.
- To ensure no pollutants (including sediment pollution) enter the adjacent watercourses during construction the following mitigation measures will be employed:
    - All necessary temporary consents will be applied for prior to commencement of works e.g. temporary discharge consent.
    - Any excavations will be dewatered as necessary and all pumped water will be discharged through a series of settlement tanks before it is discharged to sewer.

[7] MVV Environment (2016) Construction Environmental Management Plan (CEMP) Dundee & Angus Energy from Waste Combined Heat and Power Facility.

- Spill kits will be made available, and site operatives trained in their use, to deal with any spillages of materials likely to lead to contamination of site drainage systems. All spill kits will be fully stocked at all times and an inventory of equipment within the container will be clearly displayed on the lid.
- Due care and attention will be given to the prevention of surface run-off. For example, stockpiling of materials within the vicinity of drainage systems will be avoided where practicable. Where this is not possible a bund will be provided to control run off and reduce pollution risks.
- The positioning of fuel storage tanks and maintenance/refuelling facilities will be on areas of hard standing with dedicated drainage systems. All fuel storage tanks will be bunded.
- Stored materials on site will be checked regularly for containment integrity (both primary and secondary), quantity stored and security of storage.
- Ongoing monitoring programmes to ensure the adequacy of the mitigation measures being employed will also be implemented for the duration of construction.

4 Methodology

4.1 Consultation

The following stakeholders were consulted in order to gather additional data and agree the scope of surveys to support the planning application for the proposed scheme:

- Scottish Natural Heritage (SNH).
- Dundee City Council.
- Dighty Connect.
- East Dundee Environment Network (EDEN).

During consultation with the above stakeholders the requirement for a HRA screening exercise was highlighted. It was agreed that the air quality operational modelling undertaken for the necessary Permit Application would be used to confirm if the Process Contribution is likely to have a significant impact on any designated sites with respect to nutrient nitrogen or acid deposition.

No further consultation was undertaken with stakeholders in relation to the update to this HRA to assess parallel operations of both facilities. However, the proposals to operate both plants in parallel have been discussed with the "Good Neighbour Committee" which represents local residents and with both Dundee City Council and Angus Council with whom MV have a contract to operate the facilities.

4.2 Identification of European Sites

European sites located within 15km of the proposed site have been included in the screening assessment. This radius was established considering the nature and scale of the Project and in accordance with advice provided following consultation with the key stakeholders (Section 4.1). This included the following:

- Natura 2000 sites (SACs and SPAs including candidate sites).
- Ramsar sites.
- pSACs.
- pSPAs.
- pRamsar sites.
- Sites identified, or required, as compensatory measures for adverse effects on European sites.

Publically accessible websites were reviewed for information on European sites. This comprised Scottish Natural Heritage Sitelink (SNHi)[8] for the locations of

[8] Scottish Natural Heritage (SNH) Sitelink (SNHi) 'Interactive Map' Available at: http://www.snh.gov.uk/publications-data-and-research/snhi-informationservice/

designated sites and the Joint Nature Conservation Committee (JNCC)[9] for citations.

The SNH website[10] was reviewed for information regarding conservation objectives and condition assessments. Definitions for the condition assessments are provided below:[11]

- **Favourable Maintained** - the attribute targets set for the natural features have been met, and the natural feature is likely to be secure on the site under present conditions.
- **Favourable Recovered** - the condition of the natural feature has recovered from a previous unfavourable condition, and attribute targets are now being met.
- **Favourable Declining** - the attribute targets set for the natural features have been met, but evidence suggests that condition will worsen unless remedial action is taken.
- **Unfavourable Recovering** - one or more of the targets have not been met on the site, but it has begun to show, or is continuing to show, a trend towards favourable condition.
- **Unfavourable No Change** - one or more of the attribute targets have not been met, and recovery is unlikely under the present management and activity on the site.
- **Unfavourable Declining** - one or more of the attribute targets have not been met, evidence suggests that condition will worsen unless remedial action is taken.
- **Partially Destroyed** - something has happened on the site which has destroyed part of the natural feature, there is no prospect of restoring the destroyed area.
- **Totally Destroyed** - the natural feature is no longer present, there is no prospect of restoring it.

4.3 Ecology Surveys

A summary of the relevant surveys undertaken, in terms of assessing potential effects on the qualifying features of European sites, is provided below:

- Preliminary Ecological Appraisal (PEA) was undertaken in September 2015 in accordance with the JNCC guidelines.[12] This included a data search provided by McManus Museum Biological Records to identify records of protected

map/.
[9] Joint Nature Conservation Committee (JNCC), 'JNCC. UK Protected Sites.' Available at: http://jncc.defra.gov.uk/page-4.
[10] SNH (2017) SiteLink Available at: http://gateway.snh.gov.uk/sitelink/index.jsp.
[11] SNH (2016) Assessment of Condition Available at: http://www.snh.gov.uk/protecting-scotlands-nature/protected-areas/site-condition-monitoring/assessment-of-condition/.
[12] Joint Nature Conservation Committee (1993) Handbook for Phase 1 Habitat Survey: A Technique for Environmental Audit, Revised Reprint 2003.

and/or notable species within a 2km radius surrounding the proposed site. The PEA report is provided in ~~Appendix A~~ the ES Volume 2 Appendices for further detail.

4.4 Air Quality Modelling

For the purposes of this assessment, it was necessary to assess the rates of nitrogen and sulphur deposition on habitats within the European sites. This included the concentration of acidity due to the potential for adverse effects on European sites. Modelling work has been undertaken to predict the deposition rates ~~both~~ for the dual operation of the existing EfW facility and the new EfW CHP facility ~~existing DERL facility and from the proposed EfW facility and from the~~. The detailed methodology for the air quality modelling is provided in ~~Appendix B~~ Vol 2 Section 3 (Air Quality) and Vol 2 Appendices (Air Quality) of the ES[13] and briefly summarised below.

With regard to nitrogen and acid deposition, site and habitat specific Critical Loads and existing deposition rates have been taken from the Air Pollution Information System (APIS) website.[14] Predicted deposition at ecological receptors has been compared against the lowest critical loads to provide a worst case assessment.

The assessment has evaluated the Critical Load Functions (CLFs) for acidity using the graphs on the APIS website. The CLF graphs for the most sensitive species / broad habitats at each European site, as defined on the APIS website, have been used to estimate the worst case impact.

Acid deposition is assessed in terms of the Critical Load Functions (CLFs) for acidity, which are a function of nitrogen (N) and sulphur (S) deposition. The critical load functions are site- and feature/habitat-specific. Total nitrogen (N) deposition has been derived from the addition of ammonia and nitrogen dioxide.

There are specific objective pollutant concentrations for vegetation called 'Critical Levels', which are shown in Table 4.1. The SEPA H1 guidance[15] states that *'the critical levels should be applied at all locations as a matter of policy, as they represent a standard against which to judge ecological harm'*. There are also critical loads for habitats which are defined as: *'a quantitative estimate of exposure to one or more pollutants below which significant harmful effects on specified sensitive elements of the environment do not occur according to present knowledge'*. The Critical Loads used in this assessment are those for nutrient nitrogen deposition and acid deposition and are detailed in ~~Appendix B~~ Vol 2 Section 3 (Air Quality) and Vol 2 Appendices (Air Quality) of the ES.

The Critical Loads are set as ranges, reflecting the uncertainty in the present scientific knowledge and evidence-base on the effects of air pollution on sensitive

[13] MVV Environment Services Ltd (2016) Energy from Waste Combined Heat and Power Facility, Forties Road, Dundee – Environmental Statement Volume Two.
[14] APIS (Air Pollution Information System) www.apis.ac.uk, accessed January 2017
[15] EA (2016) Air emissions risk assessment for your environmental permit
Available at: https://www.gov.uk/guidance/air-emissions-risk-assessment-for-yourenvironmental-Permit.

species. If the upper limit Critical Load is being exceeded, it is likely that there will be adverse impacts on the relevant habitat / features arising from the current level of nitrogen deposition. If the deposition level is below the lower limit Critical Load, it is unlikely that there will be adverse impacts on the feature / habitat being assessed. If the deposition level lies between the lower and upper Critical Load values, it is not possible to be certain of adverse impacts occurring.

Table 4.1: Critical Levels for the Protection of Ecosystems.

Pollutant	Averaging period	Standard
Nitrogen oxides (expressed as NO2)	Annual mean	30µg/m3
	Daily mean	75µg/m3
SO2 for ecosystems where lichens and bryophytes are present	Annual mean	10µg/m3
SO2 for all other ecosystems	Annual mean	20µg/m3
NH3 for ecosystems where lichens and bryophytes are present	Annual mean	1µg/m3
NH3 for all other ecosystems	Annual mean	3µg/m3
HF	Weekly mean	0.5µg/m3
	Daily mean	5µg/m3

4.5 Assessment of Likely Significant Impacts

Any potential impacts on European sites as a result of the Project have been identified. Consideration was then given to whether the impacts would give rise to likely significant impacts on the conservation objectives of the European sites. The “in combination” assessment focussed on any projects and plans that have potential to contribute to likely significant impacts in conjunction with the Project. Significant effects in terms of the HRA would be considered to be an impact which would prevent or limit the feature from achieving its conservation objectives.

5 Designated Sites

European sites located within 15km of the proposed site are listed below and presented in Figure 5.1:

- Firth of Tay and Eden Estuary SAC.
- Firth of Tay and Eden Estuary SPA & Ramsar.
- Barry Links SAC.
- River Tay SAC.
- Outer Firth of Forth and St Andrews Bay Complex pSPA.

The designation citation, conservation objective and condition assessment for each site listed above are outlined in Sections 5.1 – 5.4 and summarised in Table 5.6. Potential impacts on the above designations as a result of the Project are summarised in Section 5.2.

5.1 Firth of Tay and Eden Estuary SAC

5.1.1 Designation Citation

Firth of Tay and Eden Estuary SAC is located approximately 1.3km south of the proposed site. This site is designated as an SAC as it supports habitats of European importance, specifically:[16][17]

Annex I habitats that are a primary reason for selection of this site include:

- Estuaries. The Firth of Tay and the Eden estuary are two high quality estuarine areas. The two estuaries have been proposed within a single site because they are integral components of a large, geomorphologically complex area that incorporates a mosaic of estuarine and coastal habitats. The Tay is the least modified of the large east coast estuaries in Scotland, while the Eden estuary represents a smaller 'pocket' estuary.

Annex 1 habitats which are present as a qualifying feature, but not a primary reason for selection of the site include:

- Sandbanks which are constantly covered by shallow sea.
- Mudflats and sandflats not covered by seawater at low tide.

The SAC also supports Annex II species that are a primary reason for selection of this site include:

[16] JNCC (No date) Firth of Tay and Eden Estuary Available at: http://jncc.defra.gov.uk/protectedsites/sacselection/sac.asp?EUCode=UK0030311.
[17] SNH (2017) Sitelink - Site Details for Firth of Tay and Eden Estuary Available at: http://gateway.snh.gov.uk/sitelink/siteinfo.jsp?pa_code=8257.

- Harbour seal *Phoca vitulina*. The Firth of Tay and Eden Estuary SAC also supports a nationally important breeding colony of Harbour seals, which are part of the east coast population of common seals that typically utilise sandbanks. Around 600 adults haul-out at the site to rest, pup and moult, representing around 2% of the UK population of this species.

5.1.2 Conservation Objectives

The conservation objectives of Firth of Tay and Eden Estuary SAC[18] are to:

To avoid deterioration of the qualifying habitats (including estuaries, intertidal mudflats and sandflats and subtidal sandbanks) thus ensuring that the integrity of the site is maintained and the site makes an appropriate contribution to achieving favourable conservation status for each of the qualifying features; and

To ensure for the qualifying habitats that the following are maintained in the long term:

- *Extent of the habitat on site.*
- *Distribution of the habitat within site.*
- *Structure and function of the habitat.*
- *Processes supporting the habitat.*
- *Distribution of typical species of the habitat.*
- *Viability of typical species as components of the habitat.*
- *No significant disturbance of typical species of the habitat.*

To avoid deterioration of the habitats of the qualifying species (Harbour seal) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained and the site makes an appropriate contribution to achieving favourable conservation status for each of the qualifying features; and

To ensure for the qualifying species that the following are maintained in the long term:

- *Population of the species as a viable component of the site.*
- *Distribution of the species within site.*
- *Distribution and extent of habitats supporting the species.*
- *Structure, function and supporting processes of habitats supporting the species.*
- *No significant disturbance of the species.*

[18]SNH (No date) Sitelink - Site Details for Firth of Tay and Eden Estuary SAC – Conservation Objectives.

5.1.3 Condition Assessment

The condition assessment of qualifying SAC features are outlined in Table 5.1 below:[19]

Table 5.1: Firth of Tay and Eden Estuary SAC Condition Assessment.

Feature	Latest Assessed Condition	Summary Condition	Last Visit Date	Feature Pressure
Estuaries		Not assessed		
Harbour seal	Unfavourable Declining	Unfavourable	22/08/2013	Recreation/disturbance
Intertidal mudflats and sandflats	Favourable Maintained	Favourable	31/12/2002	Game or fisheries management
Subtidal sandbanks	Favourable Maintained	Favourable	04/07/2002	No negative pressures

5.2 Firth of Tay and Eden Estuary SPA and Ramsar

5.2.1 Designation Citation

Firth of Tay and Eden Estuary SPA is located approximately 2.4km south-east of the proposed development. The Firth of Tay and Eden Estuary SPA is a complex of estuarine and coastal habitats in eastern Scotland stretching from the mouth of the River Earn in the inner Firth of Tay east to Barry Sands on the Angus coast and St Andrews on the Fife Coast. The site includes extensive invertebrate-rich intertidal flats and areas of reedbed, saltmarsh and sand dune. The SPA is contained within the following Special Sites of Scientific Interest (SSSIs): Inner Tay Estuary; Monifieth Bay; Barry Links; Tayport-Tentsmuir Coast; and Eden Estuary.[20]

The Firth of Tay and Eden Estuary SPA qualifies under:[21]

- **Article 4.1** of the Birds Directive by regularly supporting nationally important breeding populations of the Annex I species marsh harrier *Circus aeruginosus,* (average of 4 females in 1992-96, 3% of British population) and little tern *Sterna albifrons,* (average of 25 pairs between 1993 and 1997, 1% of British); and an internationally important wintering population of the Annex I species bar-tailed godwit *Limosa lapponica,* (2,400, 5% of GB and 2% of Western European).

[19] SNH (2017) 'Sitelink - Site Details for Firth of Tay and Eden Estuary SAC' Available at: http://gateway.snh.gov.uk/sitelink/siteinfo.jsp?pa_code=8257.
[20] JNCC (No date) SPA Description - Firth of Tay and Eden Estuary SPA Available at: http://jncc.defra.gov.uk/default.aspx?page=1968.
[21] SNH (2000) Special Protection Area (SPA) Citation for Public Issue – Firth of Tay and Eden Estuary (UK9004121).

- **Article 4.2** by regularly supporting an internationally important wintering population of redshank *Tringa tetanus,* (1,800 individuals; 2% of GB and 1% of northwest European populations).
- **Article 4.2** by regularly supporting in winter over 20,000 waterfowl with a 1990/91-94/95 winter peak mean of 48,000 waterfowl, comprising 28,000 wildfowl and 20,000 waders. This assemblage includes internationally important wintering populations (1990/91-94/95 winter peak means) of pink-footed goose *Anser brachyrhynchus,* (2,800; 1% of GB and Icelandic/Greenlandic populations) and greylag goose *A. anser* (1,200; 1% of GB and Icelandic populations) and nationally important wintering populations of cormorant *Phalacrocorax carbo* (230, 2% of GB), shelduck *Tadorna tadorna,* (1,200, 2% of GB), eider *Somateria mollissima* (13,800, 18% of GB), long-tailed duck *Clangula hyemalis* (560, 2% of GB), common scoter *Melanitta nigra,* (3,100; 9% of GB), velvet scoter *Melanitta fusca* (730, 24% of GB), goldeneye *Bucephala clangula* (230, 1% of GB), red-breasted merganser *Mergus serrator* (470, 5% of GB), goosander *Mergus merganser* (220, 2% of GB), oystercatcher *Haematopus ostralegus* (5,100, 1% of GB), grey plover *Pluvialis squatarola* (920, 2% of GB), sanderling *Calidris alba* (220, 1% of GB), dunlin *Calidris alpina* (5,200, 1% of GB) and black-tailed godwit *Limosa limosa* (150, 2% of GB).
- The Firth of Tay and Eden Estuary is also designated a Ramsar site as it is an internationally important assemblage of wintering waterfowl including internationally important populations of several species. The site also supports fourteen species of bird which breed in nationally important numbers. Abertay Sands are also important as a major haul-out site for both grey seals *Halichoerus grypus* and breeding common / harbour seals *Phoca vitulina*. The site also includes extensive invertebrate-rich intertidal mudflats and sandflats created by the massive sediment load deposited by the River Tay. Also present are large areas of reedbed and sand-dune and a small amount of saltmarsh.[22][23]

5.2.2 Conservation Objectives

The conservation objectives of the SPA are to:[24]

To avoid deterioration of the habitats of the qualifying species (listed above) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained; and

To ensure for the qualifying species that the following are maintained in the long term:

- *Population of the species as a viable component of the site.*
- *Distribution of the species within site.*

[22] JNCC (2008) Information Sheet on Ramsar Wetland (RIS) 'Firth of Tay and Eden Estuary.
[23] SNH (2017) Sitelink – Site Details for Firth of Tay and Eden Estuary Ramsar site http://gateway.snh.gov.uk/sitelink/siteinfo.jsp?pa_code=8425.
[24] SNH (No date) Sitelink - Site Details for Firth of Tay and Eden Estuary SPA – Conservation Objectives.

- *Distribution and extent of habitats supporting the species.*
- *Structure, function and supporting processes of habitats supporting the species.*
- *No significant disturbance of the species.*

5.2.3 Condition Assessment

The condition assessment of qualifying SPA bird species are outlined in Table 5.2.[25]

Table 5.2: Firth of Tay and Eden Estuary SPA Condition Assessment.

Feature	Latest Assessed Condition	Summary Condition	Date	Feature Pressure
Bar-tailed godwit, non-breeding	Favourable ~~Maintained~~ Declining	Favourable	~~28/02/2001~~ 31/03/2015	No negative pressures
Common scoter, non-breeding	Unfavourable ~~No change~~ Declining	Unfavourable	~~31/03/2008~~ 31/03/2015	~~No on-site activities related to feature condition noted~~ No negative pressures
Cormorant, non-breeding	Favourable Maintained	Favourable	~~28/02/2001~~ 31/03/2015	No negative pressures
Dunlin, non-breeding	~~Unfavourable No change~~ Favourable Declining	~~Unfavourable~~ Favourable	~~28/02/2001~~ 31/03/2015	~~Natural event~~ No negative pressures
Eider, non-breeding	~~Unfavourable No change~~ Favourable Recovered	~~Unfavourable~~ Favourable	~~28/02/2001~~ 31/03/2015	Natural event, Recreational Disturbance
Goldeneye, non-breeding	~~Favourable Maintained~~ Unfavourable Declining	~~Favourable~~ Unfavourable	~~31/03/2008~~ 31/03/2015	No negative pressures
Goosander, non-breeding	Favourable Maintained	Favourable	~~28/02/2001~~ 31/03/2015	~~Natural event~~ No negative pressures
Grey plover, non-breeding	Favourable Maintained	Favourable	~~31/03/2008~~ 31/03/2015	No negative pressures
Greylag goose, non-breeding	~~Favourable~~ Unfavourable Declining	~~Favourable~~ Unfavourable	~~31/03/2008~~ 31/03/2015	No negative pressures
Icelandic black-tailed godwit, non-breeding	Favourable Maintained	Favourable	~~31/03/2008~~ 31/03/2015	~~No negative pressures~~ Recreation/disturbance Water management

[25] SNH (2017) Sitelink – Site Details for Firth of Tay and Eden Estuary SPA Available at: http://gateway.snh.gov.uk/sitelink/siteinfo.jsp?pa_code=8501.

Little tern, breeding	Unfavourable No change	Unfavourable	28/02/2001	Natural event
Long-tailed duck, non-breeding	Unfavourable Declining	Unfavourable	~~31/03/2008~~ 31/03/2015	No negative pressures
Marsh harrier, breeding	Favourable Maintained	Favourable	~~01/09/2009~~ 01/09/2017	Recreation/disturbance
Oystercatcher, non-breeding	Favourable ~~Recovered~~ Maintained	Favourable	~~31/03/2008~~ 31/03/2015	No negative pressures
Pink-footed goose, non-breeding	Favourable ~~Recovered~~ Maintained	Favourable	~~28/10/2015~~ 31/03/2015	Natural event Recreation/disturbance-dog walking
Red-breasted merganser, non-breeding	Unfavourable ~~No change~~ Declining	Unfavourable	~~28/02/2001~~ 31/03/2015	~~Natural event~~ No negative pressures
Redshank, non-breeding	Favourable ~~Maintained~~ Declining	Favourable	~~28/02/2001~~ 31/03/2015	Invasive species
Sanderling, non-breeding	Favourable ~~Recovered~~ Maintained	Favourable	~~31/03/2008~~ 31/03/2015	No negative pressures
Shelduck, non-breeding	~~Favourable Maintained~~ Unfavourable Declining	~~Favourable~~ Unfavourable	~~31/03/2008~~ 31/03/2015	No negative pressures
Velvet scoter, non-breeding	~~Favourable Maintained~~ Unfavourable Declining	~~Favourable~~ Unfavourable	~~28/02/2001~~ 31/03/2015	No negative pressures
Waterfowl assemblage, non-breeding	Favourable Maintained	Favourable	~~01/06/2011~~ 01/05/2015	~~No negative pressures~~ Climate change Recreation/disturbance

~~The condition of the Firth of Tay and Eden Ramsar Wetland is cited as favourable for all qualifying features of interest, other than greylag goose which has been assessed as unfavourable favourable declining but with no negative pressures identified.~~

5.3 Barry Links SAC

5.3.1 Designation Citation

Barry Links SAC is located approximately 5.8km south east of the proposed development. The site is designated a SAC as it supports habitats for European importance, specifically:[26]

Annex I habitats that are a primary reason for selection of this site include:

- Embryonic shifting dunes. At Barry Links (one of three representative sites on the east coast of Scotland), there is an identifiable zone of Embryonic shifting dunes with lyme-grass *Leymus arenarius*, most frequently found on accreting sand spits. Of additional interest is the regular occurrence of an identifiable zone of sand couch *Elytrigia juncea* foredune, which may extend in summer as a narrow band in front of the main foredune ridge. There are well-developed gradations to 2120 Shifting dunes along the shoreline with *Ammophila arenaria* ('white dunes').
- Shifting dunes along the shoreline with *Ammophila arenaria* ('white dunes'). Shifting dunes along the shoreline are found as an identifiable band along the coastal edge of Barry Links on the east coast of Scotland. The site is mostly undisturbed and there are active coastal processes along the undefended seaward edge resulting in areas of dune accretion, particularly along the southern edge of the site. Where dunes are accreting, they are dominated by marram *Ammophila arenaria*, and there are well-developed transitions to dune grassland and heath.
- Fixed coastal dunes with herbaceous vegetation ('grey dunes') *Priority feature. Barry Links is one of the largest dune systems in eastern Scotland. The site is known for its very fine parabolic dunes but these and the system as a whole are now quite stable. Most of the area is occupied by acid fixed dune grassland, though there is heather Calluna heath locally, some of it rich in Cladonia lichens. Such extensive areas of comparatively unmodified fixed dune are now rare in eastern Scotland.
- Atlantic decalcified fixed dunes *Calluno Uliceta* *Priority feature. Barry Links is a large site on the east coast of Scotland and has a relatively extensive area of Atlantic decalcified fixed dunes. The dunes are part of a full successional transition from embryonic foredune to heath on fixed dune. There is a complex of dune grassland on Atlantic decalcified fixed dunes. The pattern of development of Calluna heath suggests that decalcification has occurred through leaching of the sand over an extended period of time. This is in contrast to most other sites with extensive dune heath. Usually these sites are composed of sand with an extremely low initial calcium carbonate content, and decalcification is a relatively rapid process. In addition there are transitions to wet heath, which in turn grades into dune slack.

[26] JNCC (No date) Barry Links SAC – Site Details Available at: http://jncc.defra.gov.uk/protectedsites/sacselection/sac.asp?EUcode=UK0013044.

- Humid dune slacks. Barry Links is a virtually intact dune system, composed predominantly of base-poor sand on the east coast of Scotland. The hydrology of the site is well-conserved and successional processes can be seen operating. The site has some morphological similarities to Braunton Burrows, though the range of communities is different owing to the different soil base-status and climate. The humid dune slacks occur in a complex mosaic with other sand dune habitats, several of which have been proposed as Annex I habitat types in their own right.

5.3.2 Conservation Objectives

The conservation objectives of Barry Links SAC are to:[27]

*To avoid deterioration of the qualifying habitats (including: coastal dune heathland (*Priority feature); dune grassland (*Priority feature); humid dune slacks; shifting dunes and; shifting dunes with marram)) thus ensuring that the integrity of the site is maintained and the site makes an appropriate contribution to achieving favourable conservation status for each of the qualifying features; and*

To ensure for the qualifying habitats that the following are maintained in the long term:

- *Extent of the habitat on site.*
- *Distribution of the habitat within site.*
- *Structure and function of the habitat.*
- *Processes supporting the habitat.*
- *Viability of typical species as components of the habitat.*
- *No significant disturbance of typical species of the habitat.*

5.3.3 Condition Assessment

The condition assessment of qualifying features of the SAC are outlined in Table 5.4 below:[28]

Table 5.4: Barry Links SAC Condition Assessment.

Feature	Latest Assessed Condition	Summary Condition	Last Visit Date	Feature pressure
Coastal dune heathland	Unfavourable Recovering	Favourable	07/05/2010	Burning; invasive species; lack of remedial management
Dune grassland	Unfavourable No change	Unfavourable	07/05/2010	Burning; invasive species; razing (over and

[27] SNH (No date) Sitelink - Site Details for Barry Links SAC – Conservation Objectives.
[28] SNH (2017) SiteLink – Site Details for Barry Links SAC Available at: http://gateway.snh.gov.uk/sitelink/siteinfo.jsp?pa_code=8196#features.

				under); lack of remedial management
Humid dune slacks	Unfavourable No change	Unfavourable	07/05/2011	Invasive species; military activity; lack of remedial management
Shifting dunes	Unfavourable Recovering	Favourable	07/05/2010	Coastal defence and land claim
Shifting dunes with marram	Unfavourable Recovering	Favourable	08/05/2010	Flood defence works

5.4 River Tay SAC

River Tay SAC is located approximately 10.5km north of the site. The site is designated a SAC as it supports habitats for European importance, specifically:[29]

Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:

- Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanojuncetea.

Annex II species that are a primary reason for selection of this site:

- Atlantic salmon *Salmo salar.* The River Tay supports a high-quality Atlantic salmon *Salmo sala*r population, with rod catch returns showing that the Tay is consistently one of the top three salmon rivers in Scotland. In 1999 the catch was 7230 fish, over 10% of the Scottish total. The Tay drains a very large catchment, and has the greatest flow of all UK rivers. There is considerable ecological variety in the Tay catchment, resulting in the Tay supporting the full range of salmon life-history types found in Scotland, with adult salmon entering the River Tay throughout the year to spawn in different parts of the catchment.

Annex II species present as a qualifying feature, but not a primary reason for site selection:

- Sea lamprey *Petromyzon marinus*
- Brook lamprey *Petromyzon marinus*
- Brook lamprey *Lampetra planeri*
- River lamprey *Lampetra fluviatilis*
- Otter *Lutra lutra*

[29] JNCC (No date) River Tay SAC Site Details Available at: http://jncc.defra.gov.uk/ProtectedSites/SACselection/sac.asp?EUCode=UK0030312.

5.4.1 Conservation Objectives

The conservation objectives of the River Tay SAC are to:[30]

To avoid deterioration of the qualifying habitat (clear-water lakes or lochs with aquatic vegetation and poor to moderate nutrient level) thus ensuring that the integrity of the site is maintained and the site makes an appropriate contribution to achieving favourable conservation status for each of the qualifying features; and

To ensure for the qualifying habitat that the following are maintained in the long term:

- *Extent of the habitat on site.*
- *Distribution of the habitat within site.*
- *Structure and function of the habitat.*
- *Processes supporting the habitat.*
- *Distribution of typical species of the habitat.*
- *Viability of typical species as components of the habitat.*
- *No significant disturbance of typical species of the habitat.*

Avoid deterioration of the habitats of the qualifying species (including sea lamprey, brook lamprey, river lamprey and otter) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained and the site makes an appropriate contribution to achieving favourable conservation status for each of the qualifying features; and

To ensure for the qualifying species that the following are maintained in the long term:

- *Population of the species, including range of genetic types for salmon, as a viable component of the site.*
- *Distribution of the species within site.*
- *Distribution and extent of habitats supporting the species.*
- *Structure, function and supporting processes of habitats supporting the species.*
- *No significant disturbance of the species.*

5.4.2 Condition Assessment

The condition assessment of qualifying features are outlined in Table 5.5 below:[31]

[30] SNH (No date) 'Sitelink - Site Details for River Tay SAC – Conservation Objectives'.
[31] SNH (2017) SiteLink – Site Details for River Tay SAC Available at: ~~http://gateway.snh.gov.uk/sitelink/siteinfo.jsp?pa_code=8196#features.~~ https://sitelink.nature.scot/site/8366

Table 5.5: River Tay SAC Condition Assessment.

Feature	Latest Assessed Condition	Summary Condition	Last Visit Date	Feature pressure
Clear-water lakes or lochs with aquatic vegetation and poor to moderate nutrient levels	Favourable Maintained	Favourable	12/08/2009	Water management - Water Dependant Pressure- flow regulation
Atlantic salmon	Favourable Maintained	Favourable	19/09/2011	Game/ fisheries management Invasive species Water management Water quality
Brook lamprey	Favourable Maintained	Favourable	30/11/2007	Development Water management Water quality
Otter	Favourable Maintained	Favourable	03/09/2012	Agricultural operations Invasive species Recreation/disturbance Water management
River lamprey	Favourable Maintained	Favourable	30/11/2007	Development Water management Water quality
Sea lamprey	Favourable Maintained	Favourable	30/11/2007	Development Water management Water quality

5.5 Outer Firth of Forth and St Andrews Bay Complex pSPA

5.5.1 Designation Citation

The Outer Firth of Forth and St Andrews Bay Complex pSPA is located 1.8km south of the site. The site is currently under consultation but will be designated as an SPA for supporting important populations of 21 species of marine birds. The pSPA is a large estuarine/marine site with a total area of 270.68km^2 and consists of the outer sections of the Firth of Forth and Tay, including St Andrew's Bay, together with adjacent marine waters, to the east of the Isle of May, extending in places to beyond the 12mile Territorial Sea limit[32].

[32] SNH (2017) Outer Firth of Forth and St Andrews Bay Complex Proposed Special Protection Area. Available at- https://www.nature.scot/sites/default/files/2017-11/Marine%20Protected%20Area%20%28Proposed%29%20-%20Site%20selection%20document%20-%20Outer%20Firth%20of%20Forth%20and%20St%20Andrews%20Bay%20Complex.pdf

The pSPA will qualify under:

- **Article 4.1** of the Birds Directive by regularly supporting nationally important breeding populations of the Annex I species red-throated diver during the period 2001/02 to 2004/05 (a mean peak estimate of 851 individuals; 5.0% of the Great Britain population), Slavonian grebe during the period 2006/07 to 2010/11 (an average of 30 individuals (2.7% of the Great Britain population), Little Gull during the period 2001/02 to 2004/05 (126 individuals; more than 50 individuals) and feeding common tern and Arctic tern from the adjacent breeding colonies.

- **Article 4.2** by regularly supporting populations of European importance of the following migratory waterfowl species Common eider average peak counts recorded during the five year period 2001/02 to 2004/05 (21,546 individuals 2.1% of the biogeographic population and 62 35.9% of the Great Britain population) and by regularly supporting in excess of 20,000 individual waterfowl including nationally important populations of the following species during the five year period 2001/02 to 2004/05: long tailed duck (1,948 individuals, 17.7% of the Great Britain population), common scoter (4,677 individuals, 4.7% of the Great Britain population) and during the period 2006/07-2010/11: velvet scoter (775 individuals, 31% of the Great Britain population), common goldeneye (589 individuals, 2.9% of the Great Britain population) and red-breasted merganser (369 individuals, 4.4% of the Great Britain population).

- **Article 4.2** by regularly supporting populations of European importance of the following migratory species of seabird: foraging European shag and Northern gannet

- **Article 4.2** by regularly supporting in excess of 20,000 individual seabirds during the breeding season including nationally important populations of the following species during the period 1980-2006: Atlantic puffin *Fratercula arctica* (61,086 individuals, 5.3% of the Great Britain population), black-legged kittiwake *Rissa tridactyla* (12,020 individuals,1.6% of the Great Britain population) Manx shearwater *Puffinus puffinus* (2,885 individuals, more than 2,000 individuals), common guillemot *Uria aalge* (28.123 individuals, more than 2,000 individuals) and herring gull *Larus argentatus* (3,044 individuals, 1.1% of the Great Britain population).

- **Article 4.2** by regularly supporting in excess of 20,000 individual seabirds during the non-breeding season including nationally important populations of the following species during the period 2003/04-2005/06: black-headed gull *Chroicocephalus ridibundus* (26,835 individuals,1.2% of the Great Britain population), common gull *Larus canus* (14,647 individuals, 2.1% of the Great Britain population), and herring gull (12,313 individuals, 1.7% of the Great Britain population) and, during the period 1980-2006: common guillemot (21,968 individuals, more than 2,000 individuals), European shag (2,426 individuals, 2.2% of the Great Britain population), black-legged kittiwake (3,191 individuals, more than 2,000 individuals) and razorbill *Alca torda* (5,481 individuals, more than 2,000 individuals)

5.5.2 Conservation Objectives

The pSPA has been specifically selected to protect[33]:

- *foraging areas used by seabirds breeding at nearby colony SPAs;*
- *areas used by non-breeding divers, grebes, sea ducks and gulls; and*
- *areas used by birds contributing to a waterfowl assemblage (non-breeding) and seabird assemblages (breeding and non-breeding).*

The draft conservation objectives for the pSPA are:

- *To avoid deterioration of the habitats of the qualifying species or significant disturbance to the qualifying species, subject to natural change, thus ensuring that the integrity of the site is maintained in the long-term and it continues to make an appropriate contribution to achieving the aims of the Birds Directive for each of the qualifying species.*

This contribution will be achieved through delivering the following objectives for each of the site's qualifying features:

a) Avoid significant mortality, injury and disturbance of the qualifying features, so that the distribution of the species and ability to use the site are maintained in the long-term;

b) To maintain the habitats and food resources of the qualifying features in favourable condition.

5.5.3 Condition Assessment

The condition assessment of the above features has yet to be assessed.

5.6 Designated Sites - Summary

A summary of the European site located within a 15km radius surrounding the proposed development is outlined in Table 5.6.

Table 5.6: Summary of European sites.

Site	Designation	Approximate distance from site	Qualifying Features
Firth of Tay and Eden Estuary	SAC	1.3km south	Estuaries Sandbanks which are slightly covered by sea water all the time Mudflats and sandflats not covered by seawater at low tide

[33]SNH (2017) Outer Firth of Forth and St Andrews Bay Complex Proposed Special Protection Area Accessed at https://www.nature.scot/sites/default/files/2017-11/Marine%20Protected%20Area%20%28Proposed%29%20-%20Advice%20to%20support%20management%20-%20Outer%20Firth%20of%20Forth%20and%20St%20Andrews%20Bay%20Complex.pdf

			Harbour seal	
Firth of Tay and Eden Estuary	SPA	2.4km south east	Bar-tailed godwit, non-breeding Common scoter, non-breeding Cormorant, non-breeding Dunlin, non-breeding Eider, non-breeding Goldeneye, non-breeding Goosander, non-breeding Grey plover, non-breeding Greylag goose, non-breeding Icelandic black-tailed godwit, non-breeding Little tern, breeding	Long-tailed duck, non-breeding Marsh harrier, breeding Oystercatcher, non-breeding Pink-footed goose, non-breeding Red-breasted merganser, non-breeding Redshank, non-breeding Sanderling, non-breeding Shelduck, non-breeding Velvet scoter, non-breeding Waterfowl assemblage, non-breeding
Firth of Tay and Eden Estuary	Ramsar	2.4km south east	Extensive invertebrate-rich intertidal mudflats and sandflats. Large areas of reedbed and sand-dune and a small amount of saltmarsh. The site supports an internationally important assemblage of wintering waterfowl including internationally important populations of several species including bar-tailed godwit, greylag goose, pink-footed goose and redshank. Important as a major haul-out site for both grey seals and breeding common seals.	
Barry Links	SAC	5.8km south east	Coastal dune heathland Dune grassland Humid dune slacks Shifting dunes Shifting dunes with marram	
River Tay	SAC	10.5km north	Clear-water lakes or lochs with aquatic vegetation and poor to moderate nutrient levels. Atlantic salmon Brook lamprey Otter River lamprey Sea lamprey	
Outer Firth of Forth and St Andrews	pSPA	1.8km south	Red-throated diver, non-breeding Slavonian grebe, non-breeding	European shag, breeding and non-breeding Black-legged kittiwake, breeding

Bay Complex			Little gull, non-breeding Common tern, breeding Arctic tern, breeding Common eider, non-breeding Long-tailed duck, non-breeding Common scoter, non-breeding Velvet scoter, non-breeding Goldeneye, non-breeding Red-breasted merganser, non-breeding Northern gannet, breeding Manx shearwater, breeding	and non-breeding Common guillemot, breeding and non-breeding Atlantic puffin, breeding Black-headed gull, non-breeding Common gull, non-breeding Herring gull, breeding and non-breeding Waterfowl assemblage, non-breeding Seabird assemblage, breeding and non-breeding

5.7 Potential Impacts on Designated Sites

This section reviews any potential adverse effects on European sites (including SPA, pSPA, Ramsar and SAC sites) associated with the Project to inform the assessment (Section 7).

5.7.1 Firth of Tay and Eden Estuary SAC

Runoff / pollution events

The Firth of Tay and Eden Estuary SAC is located downstream of the proposed site and is directly connected to the site via Dighty Water and Fithie Burn watercourse. Potential adverse impacts on water quality at the SAC site is possible due to contaminated runoff and the contamination of groundwater during construction. This is further assessed in Section 7.

~~However, potential impacts will be avoided through the development of a Site Waste Management Plan in adherence to requirements of Pollution and Prevention Control (PPC) regulations (Scotland 2012) (Refer to Vol 2 Section 5 (Ground Conditions and Contamination) of the ES[34] for further details). Potential impacts due to contaminated runoff and the contamination of groundwater are therefore considered to be negligible and are not considered further.~~

Air pollution and deposition

Firth of Tay and Eden Estuary SAC is considered to be sufficiently far from the proposed site not to be affected by dust associated with construction. As stated above, there is potential connectivity between the SAC site and the proposed site via Dighty Water and Fithie Burn watercourses which provide direct linkages to the designation. This is further assessed in Section 7.

[34] MMV Environmental Services Ltd (2016) 'Energy from Waste Combined Heat and Power Facility, Forties Road, Dundee – Environmental Statement Volume Two.'

~~However, risks from contaminated dust is deemed to be low due to the lack of significant contamination within the site soils.[35] Dust associated with construction will be further controlled by the implementation of control measures and best practices as detailed in the CEMP (Section 3.6). Therefore potential impacts on the SAC associated with dust is considered to be negligible and is not assessed further.~~

The features of the Firth of Tay and Eden Estuary SAC are considered to be vulnerable to indirect impacts as a result of pollution emission from the Project during operation. Utilising the information provided on the APIS website, the following qualifying SAC habitat features are sensitive to potential indirect impacts as a result of pollution emissions:[36]

- Estuaries (sensitive to nutrient nitrogen and has the potential to be sensitive to ammonia, NOx and SO2).
- Sandbanks (has the potential to be sensitive to ammonia, NOx and SO2).
- Mudflats and sandflats (Sensitive to nutrient nitrogen).

No qualifying SAC habitat features (including estuaries, sandbanks, mudflats and sandflats were deemed to be sensitive to acidification.[37] Detrimental impacts associated with acidification and SAC habitat features are therefore not discussed further within the assessment. The species broad habitat for harbour seal is not deemed to be sensitive to pollution emissions.[38] It is therefore considered unlikely that common seal will be adversely affected as a result of pollution emissions and are not assessed further.

5.7.2 Firth of Tay and Eden Estuary SPA and Ramsar

Runoff / pollution events

The Firth of Tay and Eden Estuary SPA and Ramar is located downstream of the proposed site and is directly connected to the site via Dighty Water and Fithie Burn watercourse. Potential adverse impacts on water quality at the SPA and Ramsar site is possible due to contaminated runoff and the contamination of groundwater during construction. This is further assessed in Section 7.

Visual disturbances

Owing to proximity of the proposed site to the SPA and Ramsar site (approximately 2.4km) and its urban location, direct impacts on qualifying SPA

[35] MVV Environment (2016) 'Construction Environmental Management Plan (CEMP) Dundee & Angus Energy from Waste Combined Heat and Power Facility'.
[36] APIS (Air Pollution Information System) 'Results – Firth of Tay and Eden Estuary SAC' Available at: http://www.apis.ac.uk/srcl/select-a-feature?site=UK0030311&SiteType=SAC&submit=Next.
[37] APIS (Air Pollution Information System) 'Results – Firth of Tay and Eden Estuary SAC' Available at: http://www.apis.ac.uk/srcl/select-a-feature?site=UK0030311&SiteType=SAC&submit=Next.
[38] APIS (Air Pollution Information System) 'Results – Firth of Tay and Eden Estuary SAC' Available at: http://www.apis.ac.uk/srcl/select-a-feature?site=UK0030311&SiteType=SAC&submit=Next.

bird species from visual disturbances during construction are considered unlikely. Potential impacts associated with visual disturbances on the SPA during construction are therefore not considered further.

Lighting

Due to the distance of the SPA site from the proposed scheme (approximately 2.4km) direct impacts as a result of lighting during the construction and operation of the Project are not envisaged. ~~Lighting during construction will be further controlled by the implementation of control measures and best practices as detailed in the CEMP (Section 3.6).~~ Potential impacts associated with lighting on the SPA are therefore not considered further.

Noise

Owing to proximity of the proposed site to the SPA and Ramsar site (approximately 2.4km) and its urban location, direct impacts from noise during construction and operation are considered unlikely. ~~Lighting during construction will be further controlled by the implementation of control measures and best practices as detailed in the CEMP (Section 3.6).~~ Potential impacts associated with noise on the SPA are therefore not considered further.

Air pollution and deposition

The SPA designation is considered to be sufficiently far from the proposed site not to be affected by dust associated with construction. There is potential connectivity between the SPA site and the proposed site via Dighty Water and Fithie Burn watercourses which provide direct linkages to the designation. However, risks from contaminated dust is deemed to be low due to the lack of significant contamination within the site soils.[39] ~~Dust associated with construction will be further controlled by the implementation of control measures and best practices as detailed in the CEMP (Section 3.6). Therefore potential impacts on the SPA associated with dust is considered to be negligible and is not discussed further.~~ This is further assessed in Section 7.

There is potential for indirect impacts on the SPA designation as a result of pollution emission from the Project during operation. The following qualifying SPA bird species are deemed to be sensitive to potential indirect impacts as a result of pollution emissions:[40]

- All qualifying SPA bird species are sensitive to nutrient nitrogen excluding long tailed duck, velvet scoter and common scoter.
- Common goldeneye, greylag goose, great cormorant and little tern are sensitive to acidification.
- All qualifying SPA bird species are sensitive to ammonia excluding common eider, long-tailed duck, common scoter and velvet scoter.

[39] MVV Environment (2016) Construction Environmental Management Plan (CEMP) Dundee & Angus Energy from Waste Combined Heat and Power Facility.
[40] APIS (Air Pollution Information System) Results – Firth of Tay and Eden Estuary SAC Available at: http://www.apis.ac.uk/srcl/select-a-feature?site=UK0030311&SiteType=SAC&submit=Next.

- All qualifying SPA bird species are sensitive to NO_x excluding pink-footed goose, greylag goose, common eider, long-tailed duck, common scoter and velvet scoter.

Long tailed duck, velvet scoter and common scoter qualifying bird species broad habitats are not deemed to be sensitive to air pollution and consequently are not discussed further within the assessment.

5.7.3 Barry Links SAC

Runoff / pollution events

Barry Links SAC is located upstream of the proposed site. There are no direct linkages connecting the proposed the site and the designation, which is located over 5km from the proposed site. Potential adverse impacts as a result of surface runoff or contamination of groundwater during construction and operation are therefore not envisaged and are not discussed further within the assessment.

Air pollution and deposition

The features of the Barry Links SAC are considered to be vulnerable to indirect impacts as a result of pollution emission from the Project during operation. The following qualifying SAC habitat features are sensitive to potential indirect impacts as a result of pollution emissions:[41]

- Fixed coastal dunes with herbaceous vegetation (Sensitive to nutrient nitrogen, acidification, ammonia, NO_x, and SO_2).
- Atlantic decalcified fixed dunes (Calluno-Ulicetea) (Sensitive to nutrient nitrogen, acidification, ammonia, NOx, and SO2).
- Embryonic shifting dunes (Sensitive to nutrient nitrogen and acidification).
- Shifting dunes along the shoreline with *Ammophila arenaria* ('white dunes') (Sensitive to nutrient nitrogen).
- Embryonic shifting dunes (Sensitive to nutrient nitrogen).

5.7.4 River Tay SAC

Runoff / pollution events

River Tay SAC is located over 10km upstream of the proposed site. Potential adverse impacts as a result of surface runoff or contamination of groundwater during construction are therefore not envisaged and are not discussed further within the assessment.

Disturbance to otter

The River Tay SAC is located over 10km from the proposed site but is located within the River Tay catchment. It is therefore possible that otters present within the River Tay SAC may utilise the watercourse located adjacent to the site

[41] APIS (Air Pollution Information System) 'Results – Barry Links SAC' Available at: http://www.apis.ac.uk/srcl/select-a-feature?site=UK0013044&SiteType=SAC&submit=Next.

infrequently for commuting. However given the nature and scale of the Project and the large distance between the site and the designations (over 10km), significant impacts on qualifying otter populations included within the SAC designation is considered unlikely. Potential disturbance impacts associated with otter are therefore not considered further.

Air pollution and deposition

The features of the River Tay SAC are considered to be vulnerable to indirect impacts as a result of pollution emission from the Project during operation. The following qualifying SAC habitat features are deemed to be sensitive to potential indirect impacts as a result of pollution emissions:[42]

- Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoeto-Nanojuncetea (Sensitive to nutrient nitrogen and acidification).
- Brook lamprey (Sensitive to nutrient nitrogen, acidification, ammonia and NO_x).
- River lamprey (Sensitive to nutrient nitrogen, acidification, ammonia and NO_x).
- Atlantic salmon (Sensitive to nutrient nitrogen, acidification, ammonia and NO_x).
- Otter (Sensitive to nutrient nitrogen, acidification, ammonia and NO_x).

This is further assessed in Section 7.3.

5.7.5 Outer Firth of Forth and St Andrews Bay Complex pSPA

Runoff / pollution events

The Outer Firth of Forth and St Andrews Bay Complex pSPA will lie adjacent to the Firth of Tay and Eden Estuary SPA/Ramsar and SAC and have similar qualifying features. The potential impacts on the pSPA therefore be assessed as the same for the purpose of this assessment.

The pSPA is located downstream of the proposed site and is directly connected to the site via Dighty Water and Fithie Burn watercourse. Potential adverse impacts on water quality at the SAC site is possible due to contaminated runoff and the contamination of groundwater during construction.

Visual disturbances

Owing to proximity of the proposed site to the pSPA site (approximately 1.8km south of the site) and its urban location, direct impacts on qualifying pSPA bird species from visual disturbances during construction are considered unlikely.

[42] APIS (Air Pollution Information System) 'Results – River Tay SAC' Available at: http://www.apis.ac.uk/srcl/select-a-feature?site=UK0030312&SiteType=SAC&submit=Next.

Potential impacts associated with visual disturbances on the pSPA during construction are therefore not considered further.

Lighting

Due to the distance of the pSPA site from the proposed scheme (approximately 1.8km) direct impacts as a result of lighting during the construction and operation of the Project are not envisaged. Potential impacts associated with lighting on the SPA are therefore not considered further.

Noise

Owing to proximity of the proposed site to the pSPA (approximately 1.8km) and its urban location, direct impacts from noise during construction and operation are considered unlikely. Potential impacts associated with noise on the SPA are therefore not considered further.

Air pollution and deposition

The pSPA designation is considered to be sufficiently far from the proposed site not to be affected by dust associated with construction. There is potential connectivity between the pSPA site and the proposed site via Dighty Water and Fithie Burn watercourses which provide direct linkages to the designation. However, risks from contaminated dust is deemed to be low due to the lack of significant contamination within the site soils.[43]

There is potential for indirect impacts on the pSPA designation as a result of pollution emission from the Project during operation. The following qualifying pSPA bird species are deemed to be sensitive to potential indirect impacts as a result of pollution emissions:[44]

- All qualifying pSPA bird species are sensitive to nutrient nitrogen excluding long tailed duck, velvet scoter and common scoter.
- Common goldeneye is sensitive to acidification.
- All qualifying pSPA bird species are sensitive to ammonia excluding common eider, long-tailed duck, common scoter and velvet scoter.
- All qualifying pSPA bird species are sensitive to NO_x excluding, common eider, long-tailed duck, common scoter and velvet scoter.

Long tailed duck, velvet scoter and common scoter qualifying bird species broad habitats are not deemed to be sensitive to air pollution and consequently are not discussed further within the assessment.

[43] MVV Environment (2016) Construction Environmental Management Plan (CEMP) Dundee & Angus Energy from Waste Combined Heat and Power Facility.
[44] APIS (Air Pollution Information System) Results – Firth of Tay and Eden Estuary SAC Available at: http://www.apis.ac.uk/srcl/select-a-feature?site=UK0030311&SiteType=SAC&submit=Next.

5.7.6 Summary of Potential Impacts

Further summary tables/ screening matrices for the Stage 1 Screening Assessment are provided in Appendix C.

Table 5.6: Summary of Potential Impacts on European Designated Sites.

Designation	Distance from Site	Qualifying Interest	Summary
Firth of Tay and Eden Estuary SAC	1.3km south	Estuaries dbanks which are slightly covered by sea water all the time Mudflats and sandflats not covered by seawater at low tide	Potential adverse impacts due runoff and pollution events and to air pollution and deposition
Firth of Tay and Eden Estuary SPA & Ramsar	2.4km south east	Bar-tailed godwit, non-breeding, Cormorant, non-breeding, Dunlin, non-breeding, Eider, non-breeding, Goldeneye, non-breeding, Goosander, non-breeding, Grey plover, non-breeding Greylag goose, non-breeding, Icelandic black-tailed godwit, non-breeding, Little tern, breeding, Marsh harrier, breeding, Oystercatcher, non-breeding, Pink-footed goose, non-breeding, Red-breasted merganser, non-breeding, Redshank, non-breeding, Sanderling, non-breeding, Shelduck, non-breeding, Waterfowl assemblage, non-breeding	Potential adverse impacts due runoff and pollution events and to air pollution and deposition
Barry Links SAC	5.8km south east	ed coastal dunes with herbaceous vegetation antic decalcified fixed dunes bryonic shifting dunes fting dunes along the shoreline with white dunes bryonic shifting dunes	Potential adverse impacts due to air pollution and deposition
River Tay SAC	10.5km north	Oligotrophic to mesotrophic standing waters with vegetation Brook lamprey River lamprey Atlantic salmon Otter	Potential adverse impacts due to air pollution and deposition
Outer Firth of Forth and St Andrews	1.8km south	Red-throated diver, non-breeding, Slavonian grebe, non-breeding, Little gull, non-breeding, Common tern, breeding, Arctic tern, breeding,	Potential adverse impacts due runoff and

Bay Complex		Common eider, non-breeding, Long-tailed duck, non-breeding, Common scoter, non-breeding, Velvet scoter, non-breeding, Goldeneye, non-breeding, Red-breasted merganser, non-breeding, Northern gannet, breeding, Manx shearwater, breeding, European shag, breeding and non-breeding, Black-legged kittiwake, breeding and non-breeding, Common guillemot, breeding and non-breeding, Atlantic puffin, breeding, Black-headed gull, non-breeding, Common gull, non-breeding, Herring gull, breeding and non-breeding, Waterfowl assemblage, non-breeding, Seabird assemblage, breeding and non-breeding	pollution events and to air pollution and deposition

6 Baseline Conditions and Modelling Results

6.1 Ecology Survey Results

6.1.1 Habitats

The proposed site is dominated by buildings and hardstanding associated with the existing facilities and infrastructure on-site. Semi-natural habitats within the proposed site include areas of broadleaved and mixed woodland plantations and pockets of semi-natural neutral grassland, scrub, amenity grassland and tall ruderal herbs and fern.

Invasive plant species giant hogweed *Heracleum mantegazzianum,* and Indian balsam *Impatiens glandulifera*, were recorded in several locations along the Dighty Water and Fithie Burn.

No qualifying Firth of Tay and Eden Estuary SAC habitat was identified within the site boundary or within the Zone of Influence (ZoI). Refer to ~~Appendix A and~~ Vol 2 Section 4 (Ecology) and Vol 2 Appendices (Ecology) of the ES[45] for further detail.

6.1.2 Birds

The mosaic of vegetated habitats within the proposed site, including dense and scattered scrub, broadleaved woodland, ruderal herbs and grassland, offer suitable foraging and nesting habitat for breeding birds. In total, 40 species of bird were recorded during surveys of which 18 were Species of Principal Importance (SoPI),[46] Tayside Local Biodiversity Action Plan (LBAP)[47] species and/or Red and Amber listed Birds of Conservation Concern (BoCC).[48]

No Schedule 1 species were recorded, although a potential kingfisher nest burrow was identified on the southern bank of the Dighty Water at NO4445032685.

A peregrine falcon has historically been identified flying over the initial survey area. Although potential foraging habitat for this species are present within the ZoI, it is considered that habitats within the ZoI are unsuitable for this species to nest and no evidence of peregrine habitat use was recorded during the 2016 surveys.

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[45] MVV~~MMV~~ Environment Services Ltd (2016) Energy from Waste Combined Heat and Power Facility, Forties Road, Dundee – Environmental Statement Volume Two.
[46] Scottish Government (2013) Scottish Biodiversity List Available at http://www.gov.scot/Topics/Environment/Wildlife-Habitats/16118/Biodiversitylist/SBL.
[47] Tayside Local Biodiversity Action Plan (No date) Available at: http://www.taysidebiodiversity.co.uk/action-plan/action-plan-new-lbap-2015/.
[48] Birds of Conservation Concern 4: The population status of birds in the United Kingdom, Channel Islands, and the Isle of Man Available at: https://www.rspb.org.uk/Images/birdsofconservationconcern4_tcm9-410743.pdf.

The majority of bird territories are located along the south of Drumgeith Road, within the western half of the ZoI and along the Dighty Water. Within the proposed scheme red line boundary, several territories belonging primarily to passerine species exist, particularly within the flood alleviation area. These species are generally abundant and typical of the habitats in which they were recorded, with no exceptionally rare species identified.

In summary, no qualifying Firth of Tay and Eden Estuary SPA and Ramsar bird species were identified within the site boundary or the ZoI during surveys undertaken. Furthermore, no suitable habitat for qualifying SPA bird species were identified within the site boundary or ZoI. Refer to ~~Appendix A and~~ Vol 2 Section 4 (Ecology) and Vol 2 Appendices (Ecology) of the ES[49] for further details.

6.2 Air Quality Modelling Results

A summary of model predictions taken at each European site included within the assessment is provided in Table 6.1. This shows the predicted maximum impact to air quality concentrations resulting from emissions from the dual operation of the existing DERL site and the ~~in comparison to the proposed~~ EfW CHP site. The following pollutants have been included win the modelling: nitrogen oxides (NO_x); sulphur dioxide (SO_2); ammonia (NH_3); hydrogen fluoride (HF); nitrogen dioxide (NO_2). Detailed results for each European site is provided in ~~Appendix B~~ Vol 2 Section 3 (Air Quality) and Vol 2 Appendices (Air Quality) of the ES.

SEPA's H1 guidance[50] recommends that if the predicted contribution of the installation under investigation (Process Contribution) exceeds 1% of the Critical Level, then the contribution of the installation in conjunction with the prevailing background airborne concentration (Predicted Environmental Concentration) must be assessed against the Critical Level. If the total Predicted Environmental Contribution (PEC) is less than 70% of the Critical Level, the installation is not likely to have a significant impact on the qualifying SPA, SAC and Ramsar site features. For European sites included within the assessment the H1 test set out above has been used. ~~Furthermore, the maximum 24-hour mean concentration is predicted to decrease with EfW CHP facility operation compared with the DERL facility currently in operation.~~

Currently, the operating EfW facility is predicted to exceed the 70% PEC Critical Level threshold for the maximum 24 hour mean at the Fithie Burn receptor site (72.1% PEC). With the dual operation of the existing EfW facility and the EfW CHP facility, the NOx 24 hour mean PEC is predicted to rise to 77.1%.

With regards to annual mean NOx, the 70% PEC threshold at the Fithie Burn receptor site is predicted to be met through operating the existing EfW facility in isolation (56% PEC). With the dual operations however, this predicted in annual mean NOx to rise to 71.7% PEC of the EAL.

[49] MMV Environmental Services Ltd (2016) 'Energy from Waste Combined Heat and Power Facility, Forties Road, Dundee – Environmental Statement Volume Two.'
[50] IPPC H1 (2003) Environmental Assessment and Appraisal of BAT.

All other ecological receptors (including European designated sites) identified within the Air Quality Assessment were predicted to be well below the 70% PEC threshold for all pollutants.

The Fithie Burn is located directly adjacent to the existing EfW facility and the new EfW CHP facility, where it then connects to Dighty Water and takes over 4km to reach the coast and thus the waters of the Firth of Tay and Eden Estuary SAC, SPA and Ramsar and the Outer Firth of Forth and St Andrews Bay Complex pSPA.

Whilst the predicted ground level concentrations are above the 70% PEC threshold for annual mean and 24 hour NOx, the respective Critical Levels for both pollutants are not exceeded.

It is not considered that the slight increase in both annual mean and 24 hour mean NOx from this single tributary will have a material impact on any of the conservation objectives of the European designated sites.

Table 6.1: Predicted maximum impact to air quality concentrations (µg/m3) at European Designations resulting from emissions from DERL and the Proposed EfW CHP.

				DERL		EfW CHP		
Pollutant	Averaging period	Standard (µg/m3)	Background concentration (µg/m3)	PEC concentration (µg/m3)	PEC/Standard (%)	PEC concentration (µg/m3)	PEC/Standard (%)	Change in concentration (µg/m3)
NOx	Annual mean	30	15.7	16.2	54.0%	16.7	55.7%	0.5
SO2	Annual mean	10 (lichens or bryophytes)	1.5	1.5	15.0%	1.7	17.0%	0.2
NH3	Annual mean	1 (lichens or bryophytes), 3* (other sites)	1.2	1.2	40.0%	1.2	40.0%	0.02
HF	Max weekly mean	0.5	None	0.0004	0.1%	0.014	2.8%	0.013
HF	Max 24 hour mean	5	None	0.0006	0.0%	0.022	0.4%	0.021
NO2	Max 24 hour mean	75	23.2	30.6	40.8%	26.2	34.9%	4.4

Note: *PEC/Standard calculated using 3g/m3

Pollutant	Averaging Period	AQS ug/m3	Baseline ug/m3	EfW PC ug/m3	EfW CHP PC ug/m3	Combined PC ug/m3	PC/AQS %	PEC/AQS %
NOx	Max 24 hour mean	75	32.0	22.1	3.7	25.8	34%	77.1%
	Annual mean	30	16.0	4.72	0.79	5.51	18%	71.7%
SO2	Annual mean	10	2.3	0.58	0.20	0.77	8%	30.7%
	Annual mean	20	2.3	0.58	0.20	0.77	4%	15.4%
NH3	Annual mean	1 (lichens or bryophytes), 3* (other sites)	0.96	0.02	0.02	0.04		33.3%
HF	Max 24hr hour mean	5	0	0.00	0.02	0.02	0%	0.4%
	1 week	0.5	0	0.00	0.02	0.02	3%	3.4%

Note: *PEC/Standard calculated using 3g/m3

The nutrient nitrogen deposition Critical Loads and background deposition levels are presented in Table 6.2 and the impact as a percentage of the Critical Load in Table 6.3. Table 6.4 presents the acid deposition Critical Loads and background deposition rates, Table 6.5 summarises the maximum nitrogen and sulphur deposition at designated sites and Table 6.6 summarises acid deposition impacts on European sites (Full results of the air quality modelling are provided in ~~Appendix B~~ Vol 2 Section 3 (Air Quality) and Vol 2 Appendices (Air Quality) of the ES).

The Critical Loads for qualifying SAC, SPA, pSPA and Ramsar features deemed most sensitive to nutrient nitrogen and acidity, as shown in Table 6.2 and Table 6.4, were selected as detailed below (It should be noted that that existing deposition rates exceed the minimum Critical Load values at River Tay SAC and Barry Links SAC).

Firth of Tay and Eden Estuary SAC, SPA and Ramsar:[51]

Nutrient Nitrogen

- Estuaries - Relevant Nitrogen Critical Load Class - Pioneer, low-mid, mid-upper saltmarshes - Empirical Critical Load kg N/ha/yr = **20**.
- Exceedance impacts include increase in late successional species and increase in productivity and increase in dominance of graminoids.

Acidity

- N/A - Habitats not deemed sensitive to acidity (See Section 5.1).

River Tay SAC[52]

Nutrient Nitrogen

- Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoeto-Nanojuncetea - Relevant Nitrogen Critical Load Class - Permanent oligotrophic waters: Softwater lakes Empirical Critical Load kg N/ha/yr = **3**.
- Exceedance impacts include changes in the species composition of macrophyte communities, increased algal productivity and a shift in nutrient limitation of phytoplankton from N to P.

Acidity

- Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoeto-Nanojuncetea - Acidity Class – Freshwater – **No Acidity Critical Load provided**.
- Exceedance impacts include increase Al3+ conc associated with freshwater acidification, impact on invertebrate populations, toxicity to fish.

[51] APIS (2016) Firth of Tay and Eden Estuary SAC Results Available at http://www.apis.ac.uk/srcl/select-a-feature?site=UK0030311&SiteType=SAC&submit=Next.
[52] APIS (2016) River Tay SAC Results Available at: http://www.apis.ac.uk/srcl/select-a-feature?site=UK0030312&SiteType=SAC&submit=Next.

Barry Links SAC[53]

Nutrient Nitrogen

- Fixed coastal dunes with herbaceous vegetation ('grey dunes') - Relevant Nitrogen Critical Load Class - Coastal stable dune grasslands - acid type - Empirical Critical Load kg N/ha/yr = **8**.
- Exceedance impacts include increase tall grasses, decrease prostrate plants, increased N leaching, soil acidification and loss of typical lichen species.

Acidity

- Fixed coastal dunes with herbaceous vegetatifion ('grey dunes') - Relevant Acidity Class (Acid grassland) - Acidity Critical Loads (keq) = **0.223** MaxCLminN.
- Exceedance impacts include leaching which will cause a decrease in soil base saturation, increasing the availability of Al3+ ions, mobilisation of Al3+ may cause toxicity to plants and mycorrhiza, may have direct effect on lower plants (bryophytes and lichens).

Outer Firth of Forth and St Andrews Bay Complex pSPA

The Critical Loads for the Outer Firth of Forth and St Andrews Bay Complex pSPA have yet to be formally assessed. The pSPA will lie adjacent to the Firth of Tay and Eden Estuary SPA/Ramsar and SAC and have similar qualifying features. The nutrient nitrogen and acidity levels will therefore be assessed as the same for the purpose of this assessment.

In summary, the greatest Process Contribution (PC) to nutrient nitrogen deposition at European sites is predicted to be less than 1% (which is predicted at Barry Links SAC). Acid deposition is predicted to exceed the 1% PC threshold of the Critical Load (which is also predicted at Barry Links SAC). The Predicted Environmental Deposition rate (PEDR), the sum of the Process Contribution to deposition and the background deposition rate, exceeds 70% of the Critical Load only where the existing background exceeds the minimum Critical Load values.

Table 6.2: Nutrient Nitrogen Deposition Critical Loads and Background Deposition Levels.

Designated area	Most sensitive habitat	DERL and EfW CHP facility	
		CL_{NN} (kg N/ha/yr)	Bgd dep N (kg N/ha/yr)
Firth of Tay and Eden Estuary SAC, SPA & Ramsar	Estuary/Pioneer, low-mid, mid-upper saltmarshes	20	15.68
River Tay SAC	Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoeto-Nanojuncetea	10	17.92

[53] APIS (2016) 'Barry Links SAC Results' Available at: http://www.apis.ac.uk/srcl/select-a-feature?site=UK0013044&SiteType=SAC&submit=Next.

Barry Links SAC	Sand dunes/Coastal vegetated shingle	8	9.94
Outer Firth of Forth and St Andrews Bay Complex pSPA	Estuary/Pioneer, low-mid, mid-upper saltmarshes	20	15.68

Table 6.3: Impacts as a Percentage of Critical Load.

Designated area	**Proposed EfW CHP Facility**				**Proposed EfW CHP Facility + Existing EfW Facility**			
	(PC) Max N (kg N/ha/yr)	**(PEDR) Max N + Bgd (kg N/ha/yr)**	**PC/ CL (%)**	**PEDR/ CL (%)**	**(PC) Max N (kg N/ha/yr)**	**(PEDR) Max N + Bgd (kg N/ha/yr)**	**PC/ CL (%)**	**PEDR/CL (%)**
Firth of Tay and Eden Estuary SAC, SPA & Ramsar	~~0.006~~ 0.0222	~~15.686~~ 15.70	~~0.028~~ 0.111%	~~78.428~~ 79%	~~0.021~~ 0.0588	~~15.701~~ 15.74	~~0.104~~ 0.294%	~~78.504~~ 79%
River Tay SAC	~~0.001~~ 0.0019	~~17.921~~ 17.92	~~0.005~~ 0.019%	~~179.205~~ 179%	~~0.002~~ 0.0041	~~17.922~~ 17.92	~~0.019~~ 0.041%	~~179.219~~ 179%
Barry Links SAC	~~0.006~~ 0.0222	~~9.946~~ 9.96	~~0.071~~ 0.277%	~~124.321~~ 125%	~~0.021~~ 0.0594	~~9.961~~ 10.00	~~0.263~~ 0.743%	~~124.513~~ 125%
Outer Firth of Forth and St Andrews Bay Complex pSPA	0.0222	15.70	0.111%	79%	0.0588	15.74	0.294%	79%

Table 6.4: Acid Deposition Critical Loads and Background Deposition Rates.

Designated area	**Most sensitive habitat**	**DERL and EfW CHP facility**				
		CLNmin (kg N/ha/yr)	**CLNmax (kg N/ha/yr)**	**CLS (kg N/ha/yr)**	**N bgd (kg N/ha/yr)**	**S bgd (kg N/ha/yr)**
Firth of Tay and Eden Estuary SAC, SPA & Ramsar	n/s	n/s	n/s	n/s	n/s	n/s
Firth of Tay and Eden Estuary SAC, SPA & Ramsar (Inner Tay)	Transition Saltmarsh/ Lowland fens	0.438	4.498	4.6	1.0	0.3
River Tay	No CLs	No CLs	No CLs	No CLs	No CLs	No CLs

Barry Links	Sand dunes/coastal vegetated shingle	0.223	0.63	0.38	0.71	0.21
Outer Firth of Forth and St Andrews Bay Complex pSPA	n/s	n/s	n/s	n/s	n/s	n/s

Table 6.5: Maximum Nitrogen and Sulphur Deposition on European Sites.

Designation	**Proposed EfW CHP Facility**		**Proposed EfW CHP Facility + Existing EfW Facility**	
	Max N dep (keg N/ha/yr)	**Max S dep (keg S/ha/yr)**	**Max N dep (keg N/ha/yr)**	**Max S dep (keg S/ha/yr)**
Firth of Tay and Eden Estuary SAC, SPA & Ramsar (Inner Tay Estuary)	~~0.000042~~ 0.00016	~~0.01451~~ 0.00028	~~0.0002~~ 0.00036	~~0.00028~~ 0.00063
Barry Links	~~0.000404~~ 0.00159	~~0.05123~~ 0.00285	~~0.0015~~ 0.00424	~~0.00270~~ 0.00728
Outer Firth of Forth and St Andrews Bay Complex pSPA	0.00016	0.00028	0.00036	0.00063

Table 6.6: Assessment of Acid Deposition Impact on European Sites.

Designation	**Proposed CHP EfW Facility**			**Proposed EfW CHP Facility + Existing EfW Facility**		
	PC % of Critical Load Function	**Background % of Critical Load Function**	**PEC % of Critical Load Function**	**PC % of Critical Load Function**	**Background % of Critical Load Function**	**PEC % of Critical Load Function**
Firth of Tay and Eden Estuary SPA, SAC & Ramsar (Inner Tay Estuary)	~~0.2~~ 0.03%	~~28.9~~ 29%	~~29.1~~ 29%	~~<0.1~~ 0.11%	~~28.9~~ 29%	~~28.9~~ 29%
Barry Links SAC	~~7.9~~ 2.26%	146	~~154~~ 148%	~~<0.1~~ 9.29%	146	~~146~~ 155%
Outer Firth of Forth and St Andrews Bay Complex pSPA	0.03%	29%	29%	0.11%	29%	29%

7 Appropriate Assessment ~~Assessment of Impacts~~

The proposed site does not support any qualifying habitats or species included within the European site citations. Consequently there is no potential for direct habitat loss of European sites. Potential impacts as discussed in Section 5.7 ~~associated with air pollution and deposition on the European sites~~ are considered within this section. ~~Summary tables / screening matrices are provided in Appendix C~~. Potential impacts associated with the Project are also assessed in Vol 2 Section 4 (Ecology) of the ES.[54]

7.1 Firth of Tay and Eden Estuary SAC, SPA and Ramsar

Runoff/ pollution events

Potential impacts will be avoided through the development of a Site Waste Management Plan in adherence to requirements of Pollution and Prevention Control (PPC) regulations (Scotland 2012) (Refer to Vol 2 Section 5 (Ground Conditions and Contamination) of the ES[55] for further details). Potential impacts due to contaminated runoff and the contamination of groundwater are therefore considered to be negligible and are not considered further.

Air pollution and deposition

Risks from contaminated dust is deemed to be low due to the lack of significant contamination within the site soils.[56] Dust associated with construction will be further controlled by the implementation of control measures and best practices as detailed in the CEMP (Section 3.6). Therefore potential impacts on the SAC, SPA and Ramsar associated with dust during construction is considered to be negligible and is not assessed further.

Risk from air pollution and deposition during operation are discussed in Section 7.3.

[54] MMV Environmental Services Ltd (2016) 'Energy from Waste Combined Heat and Power Facility, Forties Road, Dundee – Environmental Statement Volume Two.'
[55] MMV Environmental Services Ltd (2016) 'Energy from Waste Combined Heat and Power Facility, Forties Road, Dundee – Environmental Statement Volume Two.'
[56] MVV Environment (2016) 'Construction Environmental Management Plan (CEMP) Dundee & Angus Energy from Waste Combined Heat and Power Facility'.

7.2 Outer Firth of Forth and St Andrews Bay Complex pSPA

Runoff / pollution events

Potential impacts will be avoided through the development of a Site Waste Management Plan in adherence to requirements of Pollution and Prevention Control (PPC) regulations (Scotland 2012) (Refer to Vol 2 Section 5 (Ground Conditions and Contamination) of the ES[57] for further details). Potential impacts due to contaminated runoff and the contamination of groundwater are therefore considered to be negligible and are not considered further.

Air pollution and deposition

Dust associated with construction will be further controlled by the implementation of control measures and best practices as detailed in the CEMP (Section 3.6). Therefore, potential impacts on the pSPA associated with dust during construction is considered to be negligible and is not discussed further.

Risk from air pollution and deposition during operation are discussed in Section 7.3.

7.3 Air Pollution and Deposition

The results of the assessment (summarised in Section 6.2 and provided in full in ~~Appendix B~~ Vol 2 Section 3 (Air Quality) and Vol 2 Appendices (Air Quality) of the ES) concluded that the maximum Predicted Environmental Concentrations (PECs) for the majority of the pollutants are all well below 70% of the standard for all pollutants measured (including ~~NO,~~ SO_2, NH_3, HF~~, NO_2~~) (Section 6.2, Table 6.1 and ~~Appendix B~~ Vol 2 Section 3 (Air Quality) and Vol 2 Appendices (Air Quality) of the ES). As detailed in Section 6.2, if the total Predicted Environmental Contribution (PEC) is less than 70% of the Critical Level, the installation is not considered likely to have a significant impact on the qualifying SPA, SAC and Ramsar site features identified as being susceptible to air pollution (Table 5.6).

The dual operation of the existing EfW facility and the new EfW CHP facility, the NOx 24 hour mean PEC is predicted to rise to 77.1%. With the dual operations however, this predicted in annual mean NOx to rise to 71.7% PEC of the EAL.

All other ecological receptors (including European designated sites) identified within the Air Quality Assessment were predicted to be well below the 70% PEC threshold for all pollutants.

The Fithie Burn is located directly adjacent to the existing EfW facility and the new EfW CHP facility, where it then connects to Dighty Water and takes over 4km to reach the coast and thus the waters of the Firth of Tay and Eden Estuary SAC, SPA and Ramsar and the Outer Firth of Forth and St Andrews Bay

[57] MMV Environmental Services Ltd (2016) 'Energy from Waste Combined Heat and Power Facility, Forties Road, Dundee – Environmental Statement Volume Two.'

Complex pSPA. It is not considered that the slight increase in both annual mean and 24 hour mean NOx from this single tributary will have a material impact on any of the conservation objectives of the European designated sites.

~~Therefore, the potential impact at all European sites included within the assessment as a result of air pollution emissions from the Project is considered to be negligible and not significant. Furthermore, the maximum 24-hour mean concentration is predicted to decrease with EfW CHP facility operation compared with the DERL facility operation.~~

At European designations the process contribution to nutrient nitrogen deposition is predicted to be less than 1% (which is predicted at Barry Links) and acid deposition is just over ~~no more than 8%~~ 9% of the critical load (which is also predicted at Barry Links) (Section 6.2, Table 6.2 – 6.6 and ~~Appendix B~~ Vol 2 Section 3 (Air Quality) and Vol 2 Appendices (Air Quality) of the ES). The Predicted Environmental Deposition rate (PEDR), the sum of the Process Contribution to deposition and the background deposition rate, exceeds 70% of the Critical Load only where the existing background already exceeds the minimum Critical Load values. This is a result of existing deposition rates exceeding the minimum Critical Load values at the River Tay SAC and Barry Links SAC. It is therefore not envisaged that existing deposition rates will be adversely affected at European designations as a result of the operation of the proposed ERF. Consequently, no significant impacts on qualifying SPA, SAC and Ramsar features, identified as being susceptible to nutrient nitrogen and acid deposition and summarised in Section 5.6.5, are envisaged.

In summary, no significant adverse impacts as a result of air pollution and deposition associated with the Project on European sites are envisaged.

7.4 In-combination Effects

This assessment reviews whether there is potential for the Project to result in likely significant effects on European sites in conjunction with other plans and projects. Further information is provided in the screening matrices in Appendix C.

The first stage is to identify any effects resulting from the Project that, although not likely to be significant alone, could become significant in conjunction with other plans and projects. This has included the consideration of the following two potential future scenarios:

1. The proposed EfW CHP facility operating on diesel during hot commissioning and the DERL facility burning waste (Section 7.2.1).
2. The proposed EfW CHP facility and Michelin boiler plant, running together (Section 7.2.2).
3. The proposed EfW CHP facility, the existing EfW facility and the Michelin boiler plant, running together (Section 7.2.3).

7.4.1 Proposed EfW CHP during hot commissioning and DERL burning waste

The assessment considered the cumulative impact on pollutants that would arise from the combustion of diesel (i.e. NO_2, CO, PM_{10} and SO_2) at the proposed EfW CHP facility. Other pollutants that are emitted by the DERL facility would not be emitted from the proposed EfW CHP facility operating on diesel and so there would be no cumulative impact. The results are provided in full in ~~Appendix B~~ Vol 2 Section 3 (Air Quality) and Vol 2 Appendices (Air Quality) of the ES. In summary, the impact of adding the hot commissioning emissions to those of DERL operating on waste is negligible and the impact is not significant.

7.4.2 Proposed EfW CHP Facility plus Michelin Boilers

The assessment considers the cumulative impact of operation of the proposed EfW CHP facility in combination with boilers operating at Michelin (i.e. one boiler operating at 80% load and one on standby at 20% load with the third not operating).

This is a worst-case assessment as most of the time when the proposed EfW CHP is operating it will deliver steam to the Michelin works and therefore the boilers at Michelin will not be operating or may be on standby. The only potential for cumulative impact is from emissions of NOx as the Michelin boilers are gas-fired. Emissions of other pollutants will be negligible from Michelin. The results are provide in full in ~~Appendix B~~ Vol 2 Section 3 (Air Quality) and Vol 2 Appendices (Air Quality) of the ES. To summarise, the impact of operating the Michelin boilers running concurrently with the proposed EfW CHP results in a beneficial predicted impact to air quality. ~~compared to the current situation of DERL + Michelin.~~

7.4.3 Proposed EfW CHP Facility, the existing EfW Facility and the Michelin Plan Running Together

This assessment considers the cumulative impact of operation on the proposed EfW CHP facility in combination with the existing EfW facility and the boilers operating at Michelin.

The Michelin plant is to be decommissioned by March 2020, however the boilers are to remain in-situ. There is the potential that if another operator takes over the Michelin plant, that the boilers could be used again in the future. As the Michelin boilers are natural gas, NOx is the only potential pollutant. The potential increase in NOx at the Fithie Burn receptor site is described below in Tables 7.1 and 7.2.

All other receptor sites identified within the Air Quality Assessment were predicted to be well below the 70% PEC threshold.

Table 7.1: Existing EfW Facility and the new EfW CHP Facility

Pollutant	Averaging Period	AQS	Baseline	EfW PC	EfW CHP PC	Michelin	Combined PC	PC/ AQS	PEC	PEC/ AQS

		ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	%	ug/m3	%
NOx	24 hour	75	32.0	22.1	3.7	-	25.8	34.4%	57.81	77.1%
	Ann	30	16.0	4.7	0.6	-	5.3	17.7%	21.31	71.0%

Table 7.2: Existing EfW Facility, EfW CHP Facility and Michelin Plant Combined NOx Emissions

Pollutant	Averaging Period	AQS	Baseline	EfW PC	CHP EfW PC	Michelin	Combined PC	PC/ AQS	PEC	PEC/ AQS
		ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	%	ug/m3	%
NOx	24 hour	75	32.0	22.1	3.7	0.61	26.4	35.2%	58.42	77.9%
	Ann	30	16.0	4.7	0.6	0.043	5.35	17.8%	21.36	71.2%

The Fithie Burn is located directly adjacent to the existing EfW facility and the new EfW CHP facility, where it then connects to Dighty Water and takes over 4km to reach the coast and thus the waters of the Firth of Tay and Eden Estuary SAC, SPA and Ramsar and the Outer Firth of Forth and St Andrews Bay Complex pSPA. It is not considered that the slight increase due to the combined operation of the EfW Facility, EfW CHP Facility and Michelin Plant in both annual mean and 24 hour mean NOx from this single tributary will have a material impact on any of the conservation objectives of the European designated sites.

7.4.4 In-Combination Effects - Summary

Whilst other projects may exist within a wider area, the potential diffusion of emissions would mean that the potential for in-combination effects between the Project and other projects in excess of 600m would be greatly reduced. It is therefore concluded that there is no potential for significant effects in-combination with other projects. Consequently, no significant effects on European sites from the Project alone, or in-combination with other schemes, are envisaged.

8 Conclusion

The key results and findings of the HRA screening exercise undertaken are summarised below:

- Proposals for the site are to construct a new Energy from Waste Combined Heat and Power (EfW CHP) facility.
- The EfW CHP facility is to be run at the same time as the existing EfW facility
- Five European sites and one proposed European site are located within 15km of the proposed site. These include Firth of Tay and Eden Estuary SAC, Firth of Tay and Eden Estuary SPA and Ramsar, Barry Links SAC, River Tay SAC and the Outer Firth of Forth and St Andrews Bay Complex pSPA.
- Potential indirect impacts associated with air pollution and deposition were identified as a result of the Project on the six ~~five~~ European sites were identified.
- Potential indirect impacts associated with runoff and pollution as a result of the Project construction were identified at the Firth of Tay and Eden Estuary SAC, Firth of Tay and Eden Estuary SPA and Ramsar and the Outer Firth of Forth and St Andrews Bay Complex pSPA. These impacts were further assessed in the Appropriate Assessment. With the implementation of the CEMD, these potential indirect impacts were scoped out.
- The results of the air quality modelling were used to determine if the Process Contribution as a result of the Project is likely to have a significant impact on European sites. This was undertaken using the published Critical Levels and Critical Loads for the most sensitive qualifying SAC, SPA, pSPA and Ramsar features.
- The results of the air quality modelling showed that there are no direct impacts predicted from air quality concentrations (pollutants NOx, SO_2, NH_3 and HF), to any of the six European designated sites or their conservation objectives
- The results showed that, currently, the operating EfW facility is predicted to exceed the 70% PEC Critical Level threshold for the maximum 24 hour mean at the Fithie Burn receptor site (72.1% PEC). With the dual operation of the existing EfW facility and the EfW CHP facility, the NOx 24 hour mean PEC is predicted to rise to 77.1%. With regards to annual mean NOx, the results showed that the 70% PEC threshold at the Fithie Burn receptor site is predicted to be met through operating the existing EfW facility in isolation (56% PEC). With the dual operations however, this predicted in annual mean NOx to rise to 71.7% PEC of the EAL. The results also showed that all other ecological receptors (including European designated sites) identified within the Air Quality Assessment were predicted to be well below the 70% PEC threshold for all pollutants.

- It is not considered that the slight increase in both annual mean and 24 hour mean NOx from this single tributary will have a material impact on any of the conservation objectives of the European designated sites
- ~~The results concluded that potential impact at European sites as a result of air pollution emissions from the Project was considered to be negligible and not significant. No significant impacts on qualifying SPA, pSPA, SAC and Ramsar features associated with the deposition of nitrogen or acidity were identified.~~
- No potential for significant effects in-combination with other projects were identified.
- Consequently predicted impacts in terms of airborne pollution emissions are not considered to be significant, either alone or in-combination with other Projects. ~~Therefore a Stage 2 Appropriate Assessment is not considered necessary.~~

Appendix A[58]

~~Preliminary Ecological Appraisal~~

[58] This Appendix has been removed as it is provided in Vol 2 Appendices of the ES

Appendix B[59]

~~Dundee EfW CHP – Air Quality Assessment~~

[59] This Appendix has been removed as it is provided in Vol 2 Appendices of the ES

Appendix C

Stage 1 - Screening Matrices

C.1 Potential Impacts

Potential impacts upon the European site(s) are provided in the table below. It has not been necessary to group impacts in the screening matrices due to the simplicity of the information presented in the submission information. Therefore the impacts are presented the same in the submission information and screening matrices.

Table C1: Impacts Considered within the Screening Matrices

Designation	**Impacts in submission information**	**Presented in screening matrices as**
Firth of Tay and Eden Estuary SAC	Air pollution and deposition, runoff and pollution events	Air pollution and deposition, runoff and pollution events
Firth of Tay and Eden Estuary SPA & Ramsar	Air pollution and deposition, runoff and pollution events	Air pollution and deposition, runoff and pollution events
Barry Links SAC	Air pollution and deposition	Air pollution and deposition
River Tay SAC	Air pollution and deposition	Air pollution and deposition
Outer Firth of Forth and St Andrews Bat Complex pSPA	Air pollution and deposition, runoff and pollution events	Air pollution and deposition, runoff and pollution events

C.2 Stage 1 Screening Matrices

The European sites included within the assessment are:

- Firth of Tay and Eden Estuary SAC.
- Firth of Tay and Eden Estuary SPA & Ramsar.
- Barry Links SAC.
- River Tay SAC.
- Outer Firth of Forth and St Andrews Bay Complex pSPA.

Evidence for likely significant impacts on their qualifying features is detailed within the footnotes to the screening matrices below.

Matrix key:

✓ = Likely significant impact cannot be excluded in the HRA Stage 1 Screening

✕ = Likely significant impact can be excluded

C = construction

O = operation

D = decommissioning

Where effects are not applicable to a particular feature they are greyed out.

Where likely significant impacts cannot be excluded without mitigation (HRA Stage 1 Screening), these likely significant impacts are further discussed in Section 7: Appropriate Assessment.

In-combination effects are discussed in Section 7.4.4.

Stage 1 Matrix A: Firth of Tay and Eden Estuary SAC

Name of European site: Firth of Tay and Eden Estuary SAC						
Distance to Project: 1.3km						
European site features	**Likely Impacts of Project**					
	Air pollution and deposition			**Runoff and pollution events ~~In-combination impacts~~**		
	C	**O**	**D**	**C**	**O**	**D**
Estuaries	✓~~✗~~	✓~~✗~~		✓~~✗~~	✓~~✗~~	
Sandbanks which are slightly covered by sea water all the time	✓~~✗~~	✓~~✗~~		✓~~✗~~	✓~~✗~~	
Mudflats and sandflats not covered by seawater at low tide	✓~~✗~~	✓~~✗~~		✓~~✗~~	✓~~✗~~	
Harbour seal						

Evidence set out in this report to support conclusions include:

Air pollution and deposition

No significant impacts on qualifying SAC features identified as being susceptible to air pollution and deposition have been identified, following the implementation of mitigation measures. See Section 7: Appropriate Assessment ~~Section 5.6.5; Table 5.6; Section 6.2; Table 6.1-6.6; Section 7.1;~~ and full air quality modelling results provided in ~~Appendix B~~ Vol 2 Section 3 (Air Quality) and Vol 2 Appendices (Air Quality) of the ES.

In-combination effects

In-combination effects are discussed in Section 7.4.4 ~~No in-combination effects have been identified. See Section 7.2~~ and within the full air quality modelling result provided in ~~Appendix B~~ Vol 2 Section 3 (Air Quality) and Vol 2 Appendices (Air Quality) of the ES.

Stage 1 Matrix A: Firth of Tay and Eden Estuary SPA

Name of European site: Firth of Tay and Eden Estuary SPA						
Distance to Project: 2.4km						
European site features	**Likely Impacts of Project**					
	Air pollution and deposition			**Runoff and pollution events ~~In-combination impacts~~**		
	C	**O**	**D**	**C**	**O**	**D**
Bar-tailed godwit, non-breeding	✓~~✕~~	✓~~✕~~		✓~~✕~~	✓~~✕~~	
Common scoter, non-breeding						
Cormorant, non-breeding	✓~~✕~~	✓~~✕~~		✓~~✕~~	✓~~✕~~	
Dunlin, non-breeding	✓~~✕~~	✓~~✕~~		✓~~✕~~	✓~~✕~~	
Eider, non-breeding	✓~~✕~~	✓~~✕~~		✓~~✕~~	✓~~✕~~	
Goldeneye, non-breeding	✓~~✕~~	✓~~✕~~		✓~~✕~~	✓~~✕~~	
Goosander, non-breeding	✓~~✕~~	✓~~✕~~		✓~~✕~~	✓~~✕~~	
Grey plover, non-breeding	✓~~✕~~	✓~~✕~~		✓~~✕~~	✓~~✕~~	
Greylag goose, non-breeding	✓~~✕~~	✓~~✕~~		✓~~✕~~	✓~~✕~~	
Icelandic black-tailed godwit, non-breeding	✓~~✕~~	✓~~✕~~		✓~~✕~~	✓~~✕~~	
Little tern, breeding	✓~~✕~~	✓~~✕~~		✓~~✕~~	✓~~✕~~	
Long-tailed duck, non-breeding						
Marsh harrier, breeding	✓~~✕~~	✓~~✕~~		✓~~✕~~	✓~~✕~~	
Oystercatcher, non-breeding	✓~~✕~~	✓~~✕~~		✓~~✕~~	✓~~✕~~	
Pink-footed goose, non-breeding	✓~~✕~~	✓~~✕~~		✓~~✕~~	✓~~✕~~	
Red-breasted merganser, non-breeding	✓~~✕~~	✓~~✕~~		✓~~✕~~	✓~~✕~~	
Redshank, non-breeding	✓~~✕~~	✓~~✕~~		✓~~✕~~	✓~~✕~~	
Sanderling, non-breeding	✓~~✕~~	✓~~✕~~		✓~~✕~~	✓~~✕~~	
Shelduck, non-breeding	✓~~✕~~	✓~~✕~~		✓~~✕~~	✓~~✕~~	
Velvet scoter, non-breeding						
Waterfowl assemblage, non-breeding	✓~~✕~~	✓~~✕~~		✓~~✕~~	✓~~✕~~	

Evidence set out in this report to support conclusions include:

Air pollution and deposition

No significant impacts on qualifying SPA bird species have been identified (utilising the broad habitats identified as being susceptible to air pollution and deposition), following the implementation of mitigation measures. See Section 7: Appropriate Assessment ~~Section 5.6.5; Table 5.6; Section 6.2; Table 6.1-6.6;~~

~~Section 7.1;~~ and full air quality modelling results provided in ~~Appendix B~~ Vol 2 Section 3 (Air Quality) and Vol 2 Appendices (Air Quality) of the ES.

In-combination effects

In-combination effects are discussed in Section 7.4.4 ~~No in-combination effects have been identified. See Section 7.2~~ and within the full air quality modelling result provided in ~~Appendix B~~ Vol 2 Section 3 (Air Quality) and Vol 2 Appendices (Air Quality) of the ES.

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Stage 1 Matrix A: Firth of Tay and Eden Estuary Ramsar site

Name of European site: Firth of Tay and Eden Estuary Ramsar site						
Distance to Project: 2.4km						
European site features	**Likely Impacts of Project**					
	Air pollution and deposition			**Runoff and pollution events ~~In-combination impacts~~**		
	C	**O**	**D**	**C**	**O**	**D**
Bar-tailed godwit, non-breeding	✓~~✕~~	✓~~✕~~		✓~~✕~~	✓~~✕~~	
Greylag goose, non-breeding	✓~~✕~~	✓~~✕~~		✓~~✕~~	✓~~✕~~	
Pink-footed goose, non-breeding	✓~~✕~~	✓~~✕~~		✓~~✕~~	✓~~✕~~	
Redshank, non-breeding	✓~~✕~~	✓~~✕~~		✓~~✕~~	✓~~✕~~	
Waterfowl assemblage, non-breeding	✓~~✕~~	✓~~✕~~		✓~~✕~~	✓~~✕~~	

Evidence set out in this report to support conclusions include:

Air pollution and deposition

No significant impacts on qualifying bird species have been identified (utilising the broad habitats identified as being susceptible to air pollution and deposition), following the implementation of mitigation measures. See Section 7: Appropriate Assessment ~~Section 5.6.5; Table 5.6; Section 6.2; Table 6.1-6.6; Section 7.1;~~ and full air quality modelling results provided in ~~Appendix B~~ Vol 2 Section 3 (Air Quality) and Vol 2 Appendices (Air Quality) of the ES.

In-combination effects

In-combination effects are discussed in Section 7.4.4 ~~No in-combination effects have been identified. See Section 7.2~~ and within the full air quality modelling result provided in ~~Appendix B~~ Vol 2 Section 3 (Air Quality) and Vol 2 Appendices (Air Quality) of the ES.

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Stage 1 Matrix A: Barry Links SAC

Name of European site: Barry Links SAC						
Distance to Project: 5.8km						
European site features	**Likely Impacts of Project**					
	Air pollution and deposition			~~**In-combination impacts**~~		
	C	**O**	**D**	~~**C**~~	~~**O**~~	~~**D**~~
Coastal dune heathland	×	×		~~×~~	~~×~~	
Dune grassland	×	×		~~×~~	~~×~~	
Humid dune slacks	×	×		~~×~~	~~×~~	
Shifting dunes	×	×		~~×~~	~~×~~	
Shifting dunes with marram grass	×	×		~~×~~	~~×~~	

Evidence set out in this report to support conclusions include:

Air pollution and deposition

No significant impacts on qualifying features of interest identified as being susceptible to air pollution and deposition are envisaged. See Section 5.7.3 ~~5.6.5; Table 5.6; Section 6.2; Table 6.1-6.6; Section 7.1~~; and full air quality modelling results provided in ~~Appendix B~~ Vol 2 Section 3 (Air Quality) and Vol 2 Appendices (Air Quality) of the ES.

In-combination effects

In-combination effects are discussed in Section 7.4.4 ~~No in-combination effects have been identified. See Section 7.2~~ and within the full air quality modelling result provided in ~~Appendix B~~ Vol 2 Section 3 (Air Quality) and Vol 2 Appendices (Air Quality) of the ES.

Stage 1 Matrix A: River Tay SAC

Name of European site: River Tay SAC						
Distance to Project: 10.5km						
European site features	**Likely Impacts of Project**					
	Air pollution and deposition			~~**In-combination impacts**~~		
	C	**O**	**D**	~~**C**~~	~~**O**~~	~~**D**~~
Clear-water lakes or lochs with aquatic vegetation and poor to moderate nutrient levels	×	×		~~×~~	~~×~~	
Sea lamprey	×	×		~~×~~	~~×~~	
Atlantic salmon	×	×		~~×~~	~~×~~	
Brook lamprey	×	×		~~×~~	~~×~~	
Otter	×	×		~~×~~	~~×~~	
River lamprey	×	×		~~×~~	~~×~~	

Evidence set out in this report to support conclusions include:

Air pollution and deposition

No significant impacts on qualifying features of interest identified as being susceptible to air pollution and deposition are envisaged. See Section 5.7.4 ~~5.6.5; Table 5.6; Section 6.2; Table 6.1-6.6; Section 7.1;~~ and full air quality modelling results provided in ~~Appendix B~~ Vol 2 Section 3 (Air Quality) and Vol 2 Appendices (Air Quality) of the ES.

In-combination effects

In-combination effects are discussed in Section 7.4.4 ~~No in-combination effects have been identified. See Section 7.2~~ and within the full air quality modelling result provided in ~~Appendix B~~ Vol 2 Section 3 (Air Quality) and Vol 2 Appendices (Air Quality) of the ES.