SLOUGH MULTIFUEL PROJECT

SLOUGH MULTIFUEL EXTENSION PROJECT

[PINS Ref: EN010129]

Environmental Statement
Volume 1 – Environmental Statement

Chapter 8 – Air Quality

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AECOM

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8.0 AIR QUALITY

8.1 Introduction

8.1.1 This chapter of the Environmental Statement (ES) [EN010129/APP/6.2] addresses the potential effects of the Proposed Project on air quality. Emissions associated with combustion plant have the potential to affect human health and sensitive ecosystems, and construction could give rise to potential localised air quality effects from dust generation if not appropriately managed. This chapter describes potential environmental effects, including those that are likely to be significant associated with releases to atmosphere during the construction, operation (including maintenance), and decommissioning phases of the Proposed Project.

8.1.2 The assessment considers:

- the potential for particulate matter (dust deposition and PM_{10} size fractions, which is particulate matter of 10-micron (µm) diameter or less) and related amenity issues to arise during construction and decommissioning;
- the effects from the Proposed Project during operation, with consideration of potential impacts at sensitive human receptors; and
- the potential for particulate matter (dust deposition and PM_{10} size fractions) and odour emissions to give rise to amenity effects during operation of the Proposed Project.

8.1.3 Detailed dispersion modelling has been used to define the future baseline conditions with the Consented Development in place based on current maximum emission limit requirements and anticipated future emission limits. The methods used to model emissions to air from the stacks and other emission sources is presented in detail within a separate technical air quality dispersion modelling report (refer to **Appendix 8A [Application Document Reference 6.4.6 – Air Quality Technical Appendix]**). This chapter refers to the technical report where required to provide quantitative evidence of the baseline based on conservative assumptions. The Proposed Project does not introduce new emissions sources or emissions that were not assessed for the Consented Development. Consequently, the future baseline scenario represents an updated assessment of the emissions from the Consented Development and the future baseline scenario, using as built details.

8.1.4 A Human Health Risk Assessment (HHRA) accompanied the application for the Consented Development based on dispersion modelling at the then current maximum emission limit values and demonstrated no significant effect on human health would occur. Since the time of that assessment the maximum emission limit values have been reduced and the future environmental permit required to operate the plant will be based on these lower emission limit values requirements, requiring existing permits to be reviewed prior to 2023, and not the equivalent higher values that were in force at the time of the HHRA. The magnitude of impacts from the emissions to air from the main stack will be lower than the values used to inform

that HHRA and consequently the HHRA for the Consented Development now overestimates the risk to health by an even greater margin. As the Proposed Project does not introduce additional emissions and the emissions from the Consented Development are now lower than originally predicted, it can be concluded with confidence that no significant risk to public health would occur, without needing to update the HHRA.

8.1.5 Cooling Tower (CT) 8 and its associated pumps will be utilised by the Proposed Project. This is the same as for the Consented Development, but with the difference that it will now be solely connected to and utilised by the Proposed Project rather than operated as shared infrastructure (to other energy generating activities on the SHP site). The amount of CT blowdown/evaporation will be unchanged or less in comparison to the Consented Development because the Proposed Project will be using more of the heat to generate electricity. In addition, there is no change in the proposed number of CT operating hours for the Proposed Project compared to the Consented Development. While this assessment has used a full calendar year (8760 hours), this is to ensure that all meteorological conditions are captured, and presents a conservative assessment. The CT will not be in operation for any additional hours, and therefore the frequency and extent of any visible plume from CT8 will also be the unchanged or less and therefore cannot have a significant effect at any receptor. The effect of the emissions of water vapour plume from CT8 has therefore not been considered further in this assessment. This chapter is supported by **Figure 8.1 [Application Document Reference 6.3.12 – Air Quality Study Area – Health Receptors and Monitoring Locations]** and **Figure 8.2 [Application Document Reference 6.3.13 – Air Quality study Area – Ecological Receptors]** and **Appendix 8A [Application Document Reference 6.4.6 – Air Quality Technical Appendix]** which details the dispersion modelling undertaken.

8.1.6 The impact on designated nature conservation sites associated with emissions from the Proposed Project has been modelled and considered as part of this initial air quality assessment. The significance of the predicted effects is also discussed within **Chapter 10: Ecology [Application Document Reference 6.2.10 – ES Chapter 10]** of this ES.

8.2 Legislation and Planning Policy

8.2.1 The United Kingdom (UK) is no longer a member of the European Union (EU). Most EU legislation as it applied to the UK on 31st December 2020 is now a part of UK domestic legislation, under the control of the UK's Parliaments and Assemblies as a form of domestic legislation known as 'retained EU legislation'. This is set out in Sections 2 and 3 of the European Union (Withdrawal) Act 2018. Section 4 of the European Union (Withdrawal) Act 2018 ensures that most remaining EU rights and obligations, including directly effective rights within EU treaties, continue to be recognised and available in domestic law after exit.

Legislative Background

Air Quality Legislation

8.2.2 The principal air quality legislation within the UK is the Air Quality Standards Regulations 2010 ('the 2010 Regulations'), which transposes the requirements of the European Ambient Air Quality Directive 2008 and the 2004 fourth Air Quality Daughter Directive. The 2010 Regulations set air quality limits for a number of major air pollutants that have the potential to impact public health, such as nitrogen dioxide (NO_2), sulphur dioxide (SO_2), carbon monoxide (CO) and particulate matter (PM_{10}). The 2010 Regulations also include an exposure reduction objective for $PM_{2.5}$ in urban areas and a national target value for $PM_{2.5}$ ($PM_{2.5}$ is particulate matter of 2.5µm diameter or less).

8.2.3 The Environment Act 2021 requires the UK Government to produce a National Air Quality Strategy (NAQS), set out in 2011 (Department for Environment, Food and Rural Affairs (Defra), 2011)) and most recently reviewed in the 2019 Clean Air Strategy (Defra, 2019), containing air quality objectives and timescales to meet those objectives. These objectives apply to outdoor locations where people are regularly present and do not apply to occupational, indoor or in-vehicle exposure. The objectives that are applicable to this assessment are set out in Table 8.1 in relation to human health, and Table 8.2 in relation to ecological sites.

Table 8.1: National Air Quality Strategy Objectives (NAQS) - protection of human health

Pollutant	*Source*	*Concentration ($\mu g/m^3$)*	*Measured as*
NO_2	EU Air Quality Limit Values	40	Annual Mean
		200	1-hour mean, not to be exceeded more than 18 times per year
PM_{10}	EU Air Quality Limit Values	40	Annual Mean
		50	24-hour mean, not to be exceeded more than 35 times a year
$PM_{2.5}$	EU Air Quality Limit Values	25	Annual Mean
SO_2	UK Air Quality Strategy Objective	266	15-min mean, not be exceeded more than 35 times a year
	EU Air Quality Limit Values	350	1-hour mean, not to be exceeded more than 24-times a year
	EU Air Quality Limit Values	125	24-hour mean, not to be exceeded more than 3 times a year

Pollutant	*Source*	*Concentration ($\mu g/m^3$)*	*Measured as*
Benzene	UK Air Quality Strategy Objectives	16.25	Running annual mean
	EU Air Quality Limit Values	5	Annual Mean
CO	EU Air Quality Limit Values	10,000	Maximum daily running 8-hour mean
PAH, as BaP	EU Air Quality Target Value	0.001	Annual mean
	UK Air Quality Strategy Objectives	0.00025	Annual mean
Pb	EU Air Quality Limit Values	0.5	Annual mean
	UK Air Quality Strategy Objectives	0.25	Annual mean
As	EU Air Quality Target Values	0.006	Annual mean
Cd	EU Air Quality Limit Values	0.005	Annual mean

Table 8.2: Critical Levels for the protection of vegetation and ecosystems

Pollutant	*Source*	*Concentration ($\mu g/m^3$)*	*Measured As*	*Notes*
NH_3	Environmental Agency Environmental Permit Guidance	1	Annual mean	For sensitive lichen communities & bryophytes and ecosystems where lichens and bryophytes

Pollutant	*Source*	*Concentration (µg/m³)*	*Measured As*	*Notes*
				are an important part of the ecosystem's integrity
		3	Annual mean	For all higher plants (all other ecosystems)
SO_2	Environment Agency Environmental Permit Guidance	10	Annual mean	For sensitive lichen communities & bryophytes and ecosystems where lichens and bryophytes are an important part of the ecosystem's integrity
		20	Annual mean	For all higher plants (all other ecosystems)
NO_X (as NO_2)	Environment Agency Environmental Permit Guidance	30	Annual mean	-
		75	Daily mean	-
HF	Environment Agency Environmental Permit Guidance	<5	Daily mean	-
		<0.5	Weekly mean	-

8.2.4 The Environment Act requires local authorities to undertake an assessment of local air quality to establish whether the objectives are being achieved, and to designate Air Quality Management Areas (AQMAs) if improvements are necessary to meet the objectives. Where an AQMA has been designated, the local authority must draw up an Air Quality Action Plan (AQAP) describing the measures that will be put in place to assist in achieving the objectives. Defra has responsibility for coordinating assessments and AQAPs for the UK as a whole.

8.2.5 No AQMAs have been declared for the Site or the immediate areas and based on Defra forecast models and site specific monitoring data, air quality is considered generally good.

8.2.6 The nearest AQMA is Slough AQMA No. 3 Extension, located approximately 1.4km to the south-east of the Site. This AQMA includes Tuns Lane, a major road used as access to junction 6 of the M4. Local authority monitoring within the AQMA indicate that in 2019 there were no exceedances of the EU standards and air quality is considered generally good; however, the council will undertake further monitoring to ensure that there is a consistent improvement in air quality before considering if the AQMA order should be revoked.

Environmental Permitting Regulations

8.2.7 The Environmental Permitting (England and Wales) Regulations 2016 (EPR) apply to new and existing installations that fall under the regime and transpose the requirements of the EU Industrial Emissions Directive (IED) into UK legislation. Under the IED and EPR, the operator of an installation covered by the IED is required to employ Best Available Techniques (BAT) for the prevention or minimisation of emissions to the environment, to ensure a high level of protection of the environment as a whole.

Industrial Emissions Directive

8.2.8 The Integrated Pollution Prevention Control Reference Document on the Best Available Techniques for Waste Incineration (BREF) (European Commission (EC), 2019) provides operational limits and controls to which plants must comply. The Slough Multifuel Facility (i.e., the Consented Development and/or including the Proposed Project) will be regulated as an existing installation under the Industrial Emissions Directive (IED) regulations and in accordance with the waste incineration BREF.

8.2.9 The design of the flue gas treatment system will be fully compliant with current legislation, meeting the requirements of BAT as well as the EA guidance on risk assessment for environmental permits and the IED. In accordance with Article 15, paragraph 2, of the IED, the emission limits that the Slough Multifuel Facility will be designed to meet are based on BAT. BAT-AELs (Associated Emission Level) are included in the Waste Incineration BREF currently and these have been applied in the air impact assessment accordingly.

Sensitive Ecosystems

8.2.10 The UK is bound by the terms of the Ramsar Convention. It used to be bound by the terms of the European Birds and Habitats Directives prior to the EU exit. At present, the Conservation of Habitats and Species Regulations 2017 ('the 2017 Regulations') provides for the protection of European Sites created under these, i.e., Special Areas of Conservation (SACs) designated pursuant to the Habitats Directive, and Special Protection Areas (SPAs) and provisional SPAs (pSPAs) classified under the Birds Directive. The 2017 Regulations apply specific provisions of the European Directives to SACs, and candidate SACs (cSACs), which requires these sites to be given special consideration, and for further assessment to be undertaken for any development which is likely to lead to a significant effect upon them (see Regulation 63). Special consideration within this chapter has also been given to SPAs, pSPAs, and Ramsar sites designated as wetlands of international importance.

8.2.11 The legislation concerning the protection and management of designated sites and protected species within England is set out within the provisions of the 2010 Regulations, the Wildlife and Countryside Act 1981 (as amended) and the Countryside and Rights of Way Act 2000 (as amended).

Planning Policy Context

National Planning Policy

8.2.12 National Policy Statements (NPS) are, where in place, the primary basis for the assessment and determination of applications for nationally significant infrastructure projects (NSIPs), such as the Proposed Project. The Overarching National Policy Statement (NPS) for Energy EN-1 (Department of Energy and Climate Change, 2011a) and the National Policy Statement for Renewable Energy Infrastructure EN-3 (Department of Energy and Climate Change, 2011b) are relevant to the Proposed Project.

8.2.13 NPS EN-1 states that:

> *"The planning and pollution control systems are separate but complementary. The planning system controls the development and use of land in the public interest…Pollution control is concerned with preventing pollution through the use of measures to prohibit or limit the releases of substances to the environment from different sources to the lowest practicable level. It also ensures that ambient air and water quality meet standards that guard against impacts to the environment or human health.*
>
> *In considering an application for development consent, the IPC [Secretary of State] should focus on whether the development itself is an acceptable use of the land, and on the impacts of that use, rather than the control of processes, emissions or discharges themselves. The IPC [Secretary of State] should work on the assumption that the relevant pollution control regime and other environmental regulatory regimes…will be properly applied and enforced by the relevant regulator" (paragraphs 4.10.2-4.10.3)."*

8.2.14 EN-1 requires the consideration of significant air emissions, their mitigation and any residual effects, the predicted absolute emission levels after application of mitigation, the relative change in air quality from existing concentrations and any potential eutrophication impacts as a result of the Proposed Project stages, including contributions from additional road traffic. Where a project could result in deterioration in air quality in an area where air quality assessment limits are not being met or may lead to a new area breaching air quality assessment limits, or where substantial changes in air quality concentrations are predicted, such effects would be expected to be given substantial weight in consideration of the acceptability of the proposal. Where a project is likely to lead to a breach of statutory air quality limits the developer should work with the relevant authorities to secure appropriate mitigation measures to allow the proposal to proceed.

8.2.15 Draft NPS EN-3 provides additional guidance on the status of emission limit values listed as BAT for the Proposed Project and the Consented Development, stating that:

> *"In addition to the air quality legislation referred to in EN-1 (including the Environmental Permitting (England and Wales) Regulations 2016 (EPR) and the Air Quality Standards Regulations) the Waste Incineration Best Available*

Techniques (BAT) conclusions are also relevant to waste combustion plant. This sets out specific emission limit values for waste combustion plants."

8.2.16 The revised National Planning Policy Framework (NPPF) (Ministry of Housing, Communities & Local Government, 2021) concisely sets out national policies and principles on land use planning. Paragraph 105 of the NPPF states that:

"The planning system should actively manage patterns of growth in support of these objectives. Significant development should be focused on locations which are or can be made sustainable, through limiting the need to travel and offering a genuine choice of transport modes. This can help to reduce congestion and emissions, and improve air quality and public health."

8.2.17 Air quality is considered as an important element of the natural environment. Air quality in the UK has been managed through the Local Air Quality Management regime using national objectives. The different roles of a planning authority and a pollution control authority are addressed by the NPPF in paragraph 188:

"The focus of planning policies and decisions should be on whether proposed development is an acceptable use of land, rather than the control of processes or emissions (where these are subject to separate pollution control regimes). Planning decisions should assume that these regimes will operate effectively. Equally, where a planning decision has been made on a particular development, the planning issues should not be revisited through the permitting regimes operated by pollution control authorities."

8.2.18 The Planning Practice Guidance (PPG) was updated on 24 June 2021 (MHCLG, 2021), with specific reference to air quality. The PPG states that the planning system should consider the potential effect of new developments on air quality where relevant limits have been exceeded or are near the limit. Concerns also arise where the development is likely to adversely affect the implementation of air quality strategies and action plans and/ or, in particular, lead to a breach of EU legislation (including that applicable to wildlife). In addition, dust can also be a planning concern, for example, because of the effect on local amenity.

8.2.19 When deciding whether air quality is relevant to an application, the PPG states that a number of factors should be taken into consideration including if the development will:

- significantly affect traffic in the immediate vicinity of the Proposed Project Site or further afield. This could be by generating or increasing traffic congestion; significantly changing traffic volumes, vehicle speed or both; or significantly altering the traffic composition on local roads. Other matters to consider include whether the proposal involves the development of a bus station, coach or lorry park; adds to turnover in a large car park; or result in construction sites that would generate large Heavy Goods Vehicle flows over a period of a year or more;
- introduce new point sources of air pollution. This could include furnaces which require prior notification to local authorities; or extraction systems (including chimneys) which require approval under pollution control legislation or biomass

boilers or biomass-fuelled Combined Heat and Power (CHP) plant; centralised boilers or CHP plant burning other fuels within or close to an air quality management area or introduce relevant combustion within a Smoke Control Area;

- expose people to existing sources of air pollutants. This could be by building new homes, workplaces or other development in places with poor air quality;
- give rise to potentially unacceptable impact (such as dust) during construction for nearby sensitive locations; and
- affect biodiversity. In particular, is it likely to result in deposition or concentration of pollutants that significantly affect a European-designated wildlife site and is not directly connected with or necessary to the management of the site, or does it otherwise affect biodiversity, particularly designated wildlife sites.

8.2.20 Regarding how detailed an air quality assessment needs to be, the PPG states:

"Assessments need to be proportionate to the nature and scale of development proposed and the potential impacts (taking into account existing air quality conditions), and because of this are likely to be locationally specific."

Local Planning Policy

Slough Local Plan (March 2004) (SBC, 2004)

8.2.21 The Slough Local Plan was originally adopted in 2004, and contained a number of policies to guide development within the Borough. The document is being replaced by the Local Development Framework, and in 2007 a number of these policies were saved for inclusion within the developing Local Plan. This document does not contain any active policies with regards to air quality, however it will not be fully superseded until the adoption of the emerging Local Plan for Slough.

Slough Local Development Framework – Core Strategy 2006 – 2026 (December 2008) (SBC, 2008)

8.2.22 SBC published its Core Strategy, part of their Local Development Framework, for the period of 2006-2026 in December 2008. The Core Strategy is the overarching document within the Local Development Framework, setting out the key issues, and the objectives and policies the Council has set to achieve their ambitions. The Core Strategy contains Core Policy 8 (Sustainability and the Environment) relating directly to air pollution, which states:

"All development in the Borough shall be sustainable, of a high quality design, improve the quality of the environment and address the impact of climate change....

3. Pollution

Development shall not:

a) Give rise to unacceptable levels of pollution including air pollution, dust, odour, artificial lighting or noise;

b) Cause contamination or a deterioration in land, soil or water quality; and

c) Be located on polluted land, areas affected by air pollution or in noisy environments unless the development incorporates appropriate mitigation measures to limit the adverse effects on occupiers and other appropriate receptors."

The Proposed Spatial Strategy (November 2020) (SBC, 2020)

8.2.23 In November 2020, SBC published its Proposed Spatial Strategy as part of the Regulation 18 Consultation, ran from 9th November to the 11th January 2021. The document does not contain specific policies in relation to air quality, however it is referred to within the document as a key consideration for future development within SBC administrative area.

Other Guidance

8.2.24 The EA Risk Assessments for Specific Activities: Environmental Permits guidance (Defra and EA, 2021) provides guidance on the assessment of BAT and of impacts from permitted installations, primarily for the purposes of Environmental Permitting. As part of this, the guidance includes objective values set out in regulations as part of the NAQS Objective values (national objective values), as well as criteria values for a range of other substances not included in regulations. The criteria used in this assessment are set out in Table 8.1, Table 8.2, and Table 8.3.

Table 8.3: Environmental Assessment Levels (AQAL) – protection of human health

Pollutant	*Source*	*Concentration ($\mu g/m^3$)*	*Measured As*
CO	EA Environmental Standards	30,000	1-hour maximum
HCl	EA Environmental Standards	750	1-hour maximum
HF	EA Environmental Standards	16	Monthly mean
		160	1-hour maximum
Hg	EA Environmental Standards	0.25	Annual mean
		7.5	1-hour maximum
Sb	EA Environmental Standards	5	Annual mean
		150	1-hour maximum
As	EA Environmental Standards	0.003	Annual mean
Cr, as Cr (II) compounds and Cr (III) compounds	EA Environmental Standards	5	Annual mean
		150	1-hour maximum
Cr (VI), oxidation state in PM_{10} fraction	EA Environmental Standards	0.0002	Annual mean

Mn	EA Environmental Standards	0.15	Annual mean
		1,500	1-hour maximum
Ni	EA Environmental Standards	0.02	Annual mean
V	EA Environmental Standards	5	Annual mean
		1	1-hour maximum
NH_3	EA Environmental Standards	180	Annual mean
		2,500	1-hour maximum
PCBs	EA Environmental Standards	0.2	Annual mean
		6	1-hour maximum

8.2.25 Defra has also published Local Air Quality Management (LAQM) Technical Guidance TG (16) (Defra, 2016) to assist local authorities in fulfilling their duties in relation to LAQM. Parts of this guidance, and associated tools, are also useful in assessing the impacts of individual developments within the planning process.

8.2.26 Highways England (now National Highways) publication - the Design Manual for Roads and Bridges LA105 – Air Quality (DMRB) (Highways England, 2019) has been used to screen potential traffic air quality impacts to determine those impacts that may require more detailed assessment, and in the assessment of traffic air quality effects and the evaluation of significance.

8.2.27 The Institute of Air Quality Management (IAQM) has published several guidance documents relating to the potential effects of dust generation during construction works and development control (IAQM, 2014, 2016 and 2017).

8.3 Assessment Assumptions and Limitations

8.3.1 The assessment presented in this chapter utilises the data available at the time and assesses a robust scenario for the likely effects of the Proposed Project.

8.3.2 The construction period of the Proposed Project has been assessed as being of two months duration. If the duration was slightly longer or was not carried out in parallel with the construction activities for the Consented Development, it would not alter the conclusions of the reported assessment.

8.3.3 The Consented Development has been issued with an environmental permit by the Environment Agency. As part of a national program to update permits for existing facilities to reflect revisions to BREF guidance, at some point in late 2022 or during 2023 the permitted emission limit values (ELVs) for the Consented Development will be reduced. The expected ELVs have been modelled, but this will be discussed with the EA following statutory consultation and where there is still doubt the chapter presents the highest allowed levels of emissions at the point of writing (July 2022). This limitation only affects baseline emissions from the Consented Development and the conclusions of the assessment for the Proposed Project would remain unchanged.

8.4 Assessment Methodology

Overview

8.4.1 Full details of the methodology and approach taken in respect of this assessment are provided within **Appendix 8A [Application Document Reference 6.4.6 – Air Quality Technical Appendix]** of this ES.

8.4.2 The technical assessment report within **Appendix 8A [Application Document Reference 6.4.6 – Air Quality Technical Appendix]** provides a detailed description of the definition of sensitive human receptors, definition of sensitive ecological receptors, the methodology for the dispersion modelling of stack emissions and the methodology for screening operational and construction traffic changes.

8.4.3 A comparison of the effects between the Consented Development and the Proposed Project is provided in Section 8.8.16.

Impact Assessment and Significance Criteria

8.4.4 The potential emissions to air from construction and operation of the Proposed Project have been determined or estimated, and key local receptors have been identified, together with the current local ambient air quality. The potential concentrations resulting from the projected emissions arising from the operational Proposed Project have been predicted using atmospheric dispersion modelling techniques where appropriate. This has enabled the assessment of the impacts associated with the Proposed Project on the existing local ambient air quality and in particular on the identified sensitive receptors. The assessment methodology for each type of emission is detailed below.

8.4.5 The air quality assessment does not use the standard matrix for classification of effects as set out in **Chapter 6: Environmental Impact Assessment Methodology [Application Document Reference 6.2.6 – ES Chapter 6]** of this ES as specific guidance is used to determine air quality effects, however, to enable cross-reference between all technical chapters of the ES the same terminology has been adopted whereby effects are described as negligible, minor, moderate or major and adverse of beneficial.

8.4.6 The process and traffic emissions assessments have been made with reference to the air quality assessment levels (AQALs) and objectives laid out in the Air Quality Standards Regulations and environmental standards set out within EA guidance.

Development Scenarios

8.4.7 As outlined in **Chapter 2: Proposed Project [Application Document Reference 6.2.2 – ES Chapter 2]** of this ES, the construction phase is expected to occur concurrently with the Consented Development. The assessment of air quality impacts during construction considers dust and emissions from activities and plant on Site.

8.4.8 As described in Paragraph 8.7.6, the operational air quality assessment is based on a design with a single stack with a fixed release height of 90m above ground level. The stack is part of the Consented Development. The building dimensions used in the air quality assessment are detailed in **Appendix 8A [Application Document Reference 6.4.6 – Air Quality Technical Appendix]** of this ES. The operation of the Proposed Project has been assessed with the use of two different types of fuel: a design fuel of 12MJ/kg and a lower caloric value fuel of 10.5MJ/kg. Detailed results for each scenario are included in **Appendix 8A [Application Document Reference 6.4.6 – Air Quality Technical Appendix]** of this ES.

Extent of Study Area

8.4.9 The study area for the stack emissions from the operational development extends up to 15km from the Site, in order to assess the potential impacts on sensitive human health and ecological receptors, in line with the EA risk assessment methodology (Defra and EA, 2021). However, in practice the predicted impacts become negligible within a much smaller distance from the Site (circa 2km).

8.4.10 The Study Area for construction dust and Non-Road Mobile Machinery (NRMM) emissions has been applied, in line with IAQM guidance (IAQM, 2014), extending:

- up to 350m beyond the Site boundary and 50m from the construction traffic route (up to 500m from the Site entrances) for human health receptors; and
- up to 50m from the Site boundary and/or construction traffic route (up to 500m from the Site entrances) for ecological receptors.

Assessment of Dust Emissions Generated During Construction Works

8.4.11 The movement and handling of soils and spoil during construction activities has the potential to the generation of some short-term airborne dust. The occurrence and significance of dust generated by earth moving operations is difficult to estimate and depends heavily upon the meteorological and ground conditions at the time and location of the work within the Site, and the nature of the actual activity being carried out. The Proposed Project will not result in disturbance to unconsolidated materials.

8.4.12 At present, there are no statutory UK or EU standards relating to the assessment or control of dust.

8.4.13 The emphasis of the regulation and control of construction dust is therefore through the adoption of good working practice on Site. It is intended that significant adverse environmental effects are avoided at the design stage and through embedded mitigation where possible, including the use of good working practices to minimise dust formation which is detailed further in Section 8.7.2 of this chapter.

8.4.14 IAQM provides guidance for good practice qualitative assessment of risk of dust emissions from construction and demolition activities (IAQM, 2014). The guidance considers the risk of dust emissions from unmitigated activities to cause human health (PM_{10}) impacts, dust soiling impacts, and ecological impacts (such as physical smothering, and chemical impacts for example from deposition of alkaline materials). The appraisal of risk is based on the scale and nature of activities and

on the sensitivity of receptors, and the outcome of the appraisal is used to determine the level of good practice mitigation required for adequate control of dust.

8.4.15 The assessment undertaken for this chapter is consistent with the overarching approach to the assessment of the impacts of construction of the Proposed Project as outlined in **Chapter 6: Environmental Impact Assessment Methodology [Application Document Reference 6.2.6 – ES Chapter 6]** of this ES and the application of example descriptors of impact and risk set out in IAQM guidance. It considers the significance of potential impacts with no mitigation and recommends mitigation measures appropriate to the identified risks to receptors. The steps in the assessment are to:

- identify receptors within the screening distance of the Site boundary;
- identify the magnitude of impact through consideration of the scale, duration and location of construction activities being carried out;
- establish the sensitivity of the area through determination of the sensitivity of receptors and their distance from construction activities;
- determine the risk of significant impacts on receptors occurring as a result of the magnitude of impact and the sensitivity of the area, assuming no additional mitigation (beyond the identified development design and impact avoidance measures) is applied;
- determine the level of mitigation required based on the level of risk, to reduce potential impacts at receptors to insignificant or negligible; and
- summarise the potential residual effects of the mitigated works.

8.4.16 The criteria for assessment of magnitude, sensitivity and risk are summarised in Tables 8A.3 - 8A.8 in **Appendix 8A [Application Document Reference 6.4.6 – Air Quality Technical Appendix]** of this ES.

Assessment of Emissions Generated from Construction Site Plant (Non Road Mobile Machinery (NRMM))

8.4.17 As outlined in **Chapter 2: Proposed Project [Application Document Reference 6.2.2 – ES Chapter 2]** of this ES, the construction phase is expected to run concurrently with the construction of the Consented Development and be completed before the Consented Development becomes operational. If the Proposed Project were to be constructed after works for the Consented Development had been completed the magnitude of potential impacts and the measures required to appropriately minimise emissions would be the same as considered in this assessment.

8.4.18 There are likely to be emissions to air during construction activities arising from on-Site construction plant or NRMM. The IAQM guidance (IAQM, 2014) states:

"Experience of assessing the exhaust emissions from on-site plant … and site traffic suggests that they are unlikely to make a significant impact on local air quality, and in the vast majority of cases they will not need to be quantitatively

assessed. For site plant and on-site traffic, consideration should be given to the number of plant/vehicles and their operating hours and locations to assess whether a significant effect is likely to occur".

8.4.19 The screening criterion in DMRB (HE, 20019), which states that only properties and habitat sites within 200m of roads should be considered in traffic assessments, has also been considered in determining the potential for impacts from NRMM on sensitive receptors. A qualitative assessment of the potential for impact from NO_2 and PM_{10} emissions from NRMM on identified receptors has therefore been made based on the criteria outlined in the above guidance.

Assessment of Process Emissions from the Operational Plant at Year of Opening

8.4.20 Emissions from the Proposed Project, assumed to be operational in 2024, have been assessed using the IAQM assessment methodology (IAQM 2019) in order to identify where proposed emissions can be screened as having a negligible impact. Detailed dispersion modelling using the atmospheric dispersion model ADMS 5.2 has been used to calculate the concentrations of pollutants at identified receptors for the future baseline scenario and for the Proposed Project. These concentrations have been compared with the air quality assessment level for each pollutant species for the future baseline scenario, as summarised in Table 8.1, Table 8.2 and Table 8.3.

8.4.21 Dispersion modelling calculates the predicted concentrations arising from the emissions to atmosphere, based on Gaussian approximation techniques. The model employed has been developed for UK regulatory use.

8.4.22 The first year of operation (referred to as opening) of the Proposed Project is assumed to be 2024 for the purpose of this assessment, which is the earliest date that the Proposed Project could realistically start to export power commercially. The hours of operation of the Consented Development will not be increased as a result of the Proposed Project. It is expected that the Proposed Project will operate for approximately 8,000 hours per annum (to allow for offline periods for maintenance), which is the same as the Consented Development. [The Proposed Project is not capable of operating independently from the Consented Development.] However, for the purpose of this ES, assessments have been undertaken on the basis of the Proposed Project operating continually, for twenty-four hours per day, seven days a week (i.e., for a total of 8,760 hours per annum) so that a "worst case scenario" has been assessed. This again is as per the assessments for the Consented Development.

8.4.23 The assessment of worst-case long-term (annual mean) and short-term (daily and hourly mean) emissions resulting from operation of the Proposed Project has been undertaken by comparison of the maximum magnitude of change at identified sensitive receptors with the annual mean and hourly mean objectives, and the Environmental Standards set out in

8.4.24 Table 8.2 for ecological receptors, taking into consideration the predicted future baseline air quality, using the EA risk assessment methodology (Defra and EA, 2021).

8.4.25 An assessment of nutrient nitrogen enrichment has been undertaken by applying published deposition velocities to the predicted annual average NO_x concentrations at the identified Statutory Habitat sites, determined through dispersion modelling, to calculate nitrogen deposition rates. These deposition rates have then been compared to the Critical Loads for nitrogen published by UK Air Pollution Information System (APIS) (Centre for Ecology and Hydrology and APIS, 2021) for the most sensitive species in each individual Habitat site, taking into consideration the future baseline air quality.

8.4.26 Potential increases in acidity on designated ecological receptors from depositional contributions of NO_X from the process contribution have also been considered. In this assessment, the nitrogen kilo equivalent Keq/ha/yr, which are the units in which acidity Critical Loads are measured, have been derived from nitrogen deposition modelling values using standard conversion factors. The acidity deposition rates, and baseline deposition rates have been used within the Critical Load Function Tool (Centre for Ecology and Hydrology and APIS, 2021) to determine whether the contribution will result in exceedance of the defined acidity Critical Loads for the most sensitive feature. Future baseline process contributions of NH_3, HF, HCl and SO_2 to the background acidity deposition rate have also been included in the acid deposition calculations.

Evaluation of Significance – Construction Phase Emissions

8.4.27 For potential amenity effects, such as those related to dust deposition, the aim is to bring forward a scheme, to include mitigation measures as necessary, that minimises the potential for amenity (including dust soiling), human health, and ecological impacts as a result of the Proposed Project construction works.

8.4.28 The IAQM guidance (IAQM, 2014) does not provide a method for the evaluation of impacts on receptors from construction dust, rather a means to determine the level of mitigation required to avoid significant impacts on receptors. The guidance indicates that the application of appropriate mitigation should ensure that residual effects will normally be ‘not significant’.

Evaluation of Significance – Operational Emissions

8.4.29 The evaluation of the significance of operational emissions on sensitive receptors considers the change in predicted pollutant concentrations against criteria set out in the 2010 Regulations and published guidance by Defra and the EA (Defra and EA, 2021).

8.4.30 Air Quality Objectives were previously provided in the National Air Quality Strategy (NAQS), which was published in 2011, however in the 2019 Clean Air Strategy update there is no reference to any objectives. Therefore, the term Air Quality Assessment Level (AQAL) will be used instead of NAQS or Air Quality Objectives.

8.4.31 For a change of a given magnitude, the IAQM publication ‘Land-Use Planning & Development Control: Planning for Air Quality (IAQM, 2017) has published recommendations for describing the magnitude of long term impacts at individual receptors and describing the significance (refer to Table 8.4) of effects. This terminology has been changed where appropriate in order to maintain consistency

with the rest of this ES **[Application Document Reference 6.2]** – where the IAQM uses 'substantial' this has been changed to 'major', and 'slight' has been changed to 'minor'.

Table 8.4: Air quality effect descriptor for long term changes in ambient pollutant concentrations

Long term averaging concentration at receptor	*Percentage change in annual mean concentrations*				
	up to 0.5%	*0.5 – 1%*	***2-5%***	***6-10%***	***>10%***
	Imper-ceptible	***Very Low***	***Low***	***Medium***	***High***
75% or less of AQAL	Negligible	Negligible	Negligible	Minor	Moderate
76-94% of AQAL	Negligible	Negligible	Minor	Moderate	Moderate
95-102% of AQAL	Negligible	Minor	Moderate	Moderate	Major
103-109% of AQAL	Negligible	Moderate	Moderate	Major	Major
110% or more of AQAL	Negligible	Moderate	Major	Major	Major

AQAL = Air Quality Assessment Level (Limit Value or Environmental Standard)

8.4.32 The IAQM guidance (IAQM, 2017) is not explicit in the identification of whether any of the above effect descriptors should be considered 'significant' or 'not significant', rather it indicates that the descriptors should be applied to individual receptors and a 'moderate' adverse effect at one receptor may not mean that the overall effect is significant; other factors need to be considered. However, it indicates further that 'negligible' effects are likely to lead to effects that are 'not significant' and 'major' effects describe the potential for 'significant' effects. The judgment of significance of effects adopted within this assessment is discussed below.

8.4.33 The evaluation of the significance of air quality effects from the operational point sources (stack emissions) has been based on the criteria referenced in the IAQM publication (IAQM, 2017), and on the criteria outlined in the EA EPR Risk Assessment (Defra and EA, 2018d).

8.4.34 The IAQM guidance (IAQM, 2017) indicates that the EA threshold criterion of 10% of the short term AQAL is sufficiently small in magnitude to be regarded as having an 'insignificant' effect. The IAQM guidance deviates from the EA guidance (discussed below) with respect to the background contribution; the IAQM guidance indicates that severity of peak short-term concentrations can be described without the need to reference background concentrations as the process contribution (PC) is used to measure impact, not the overall concentration at a receptor. The peak short term PC from an elevated source is described as follows:

- PC <=10% of the AQAL represents an 'insignificant' (negligible) impact;

- PC 11-20% of the AQAL is small in magnitude representing a 'slight' (minor) impact;
- PC 21-50% of the AQAL is medium in magnitude representing a moderate impact; and
- PC >51% of the AQAL is large in magnitude representing a 'substantial' (major) impact.

8.4.35 The EA EPR Risk Assessment (Defra and EA, 2018d) screening criteria for comparison of PCs with AQAL objectives state that an emission may be considered insignificant (or negligible) where:

- Short term PC <=10% of the AQAL; and
- Long term PC <=1% of the AQAL.

8.4.36 The second stage of screening considers the PCs in the context of the existing background pollutant concentrations; the predicted environmental concentration (PEC) is considered acceptable where:

- short term PC <20% of the short-term AQAL minus twice the long-term background concentration; and
- long term Predicted Environmental Concentration (PEC) (PC + background concentration) <70% of the AQAL.

8.4.37 Where the PEC is not predicted to exceed the AQAL and the proposed emissions comply with the BAT associated emission levels (or equivalent requirements) the emissions are considered acceptable by the EA.

8.4.38 The effect of point source emissions on ecological receptors, through deposition of nutrient nitrogen or acidity, has been evaluated using the EA insignificance criterion of 1% of the long term objective, as above.

8.4.39 Where emissions are not screened as insignificant (negligible), the descriptive terms for the air quality effect outlined in Table 8.4 have been applied.

Evaluation of Significance – Proposed Project

8.4.40 Following the assessment of each individual air quality effect, the significance of all of the reported effects is then considered for the Proposed Project in overall terms, compared to the future baseline conditions of the Consented Development. The potential for the Proposed Project to contribute to or interfere with the successful implementation of policies and strategies for the management of local air quality are considered if relevant, but the principal focus is any change to the likelihood of future achievement of the air quality standards (which also relate to compliance with local authority goals for local air quality management and objectives that are set for the protection of human health).

8.4.41 In terms of the significance of the effects (consequences) of any impacts, an effect is reported as being either 'not significant' or as being 'significant'. If the overall effect of the development on local air quality or on amenity is found to be

'moderate' or 'major' this is deemed to be 'significant' for EIA purposes. Effects found to be 'minor' or 'negligible' are considered to be 'not significant'.

Sources of Information / Data

Operational Phase Data

8.4.42 The physical parameters for the modelling of emissions from the Consented Development stacks have been sourced from the concept design data provided by the process engineers HZI, and the pollutant mass emission rates have been calculated by AECOM, based on the relevant IED emission limits. They are summarised in Table 8A.12 and Table 8A.13 of **Appendix 8A [Application Document Reference 6.4.6 – Air Quality Technical Appendix]** in this ES.

8.4.43 The dispersion modelling of point source emissions has taken into consideration the sensitivity of predicted results to model input variables, and to ultimately identify the realistic worst-case results for inclusion in the assessment. These variables include:

- meteorological data, for which five years' recent data from a representative meteorological station have been used; and
- inclusion of buildings, structures and local topography that could affect dispersion from the source into the modelling scenarios.

8.4.44 The dispersion modelling does not include a separate scenario to represent the Proposed Project emissions as these are nil. The future baseline dispersion model scenario is therefore fully representative of combined emissions from the Consented Development and the Proposed Project.

8.5 Stakeholder Engagement

8.5.1 A Scoping Opinion (refer to **Appendix 1B [Application Document Reference 6.4.2 – PINS Scoping Opinion]** of this ES) has been received from the Planning Inspectorate, on behalf of the Secretary of State, providing an opinion on the matters to be included within this ES **[Application Document Reference 6.2].**The following items listed within the Scoping Opinion were scoped out, and agreed with The Planning Inspectorate:

- Two Local Nature Reserves (Haymill Valley and Cocksherd Wood LNRs) and three non-statutory sites (Haymill Valley, Cocksherd Wood and Boundary Copse Woodland Trust Reserve);
- Construction phase traffic emissions on local air quality; and
- Demolition and earthwork stages of the construction phase.

8.5.2 For those items not scoped out in agreement with The Planning Inspectorate, how these items have been addressed and their location within this ES chapter and supporting appendix are shown in Table 8.5.

8.5.3 No comments were received from any stakeholders relevant to this chapter during statutory consultation.

Table 8.5: Main Matters Raised

Consultee	*Main matter raised*	*How has the concern been addressed*	*Location of response in this ES*
Secretary of State/PINS	Is an updated Human Health Risk Assessment (HHRA) needed ?	The Consented Development was approved under the previous version of the Waste Incineration BREF note, published in 2006. Since the approval, an updated BREF note has been published (European Commission, 2019), which includes updated Emission Limit Values (ELVs) which are more stringent than those published in the previous version. The HHRA undertaken for the Consented Development used the ELVs from the previous version of the BREF note; however, the Proposed Project will be permitted using the current BREF note, and will be required to achieve the more stringent ELVs. The HHRA published for the Consented Development is considered to be a conservative assessment of the potential health effects due to emissions from the Consented Development, and the Proposed Project is unlikely to cause a significant increase in health risks.	Section 8.1.4
	How potential odour emissions would be controlled	Details of the measures to control odour emissions, including those used in the Consented Development, have been described.	Section 8.6.23 - 8.6.24
	Potential effects on Air Quality Management	The details of the existing air quality within SBC's administrative area, including the details of all designated AQMAs, have been included. Those AQMAs considered	Section 8.6.

Consultee	*Main matter raised*	*How has the concern been addressed*	*Location of response in this ES*
	Areas (AQMAs)	likely to be impacted by the Proposed Project and the justification for inclusion as a specified receptor has been set out.	
	Potential effects on ecological receptors	Internationally designated ecological sites within 15km, and nationally designated sites within 2km, of the Proposed Project that are considered to be sensitive to air quality have been included as receptors within the assessment.	List of receptors used in this assessment is shown in Table 8A.16 (**Appendix 8A [Application Document Reference 6.4.6 – Air Quality Technical Appendix])**
	The potential Impacts of dust at receptors should be assessed	The assessment of construction dust risk will be in line with guidance published by the Institute of Air Quality Management (IAQM, 2014), and the screening criteria used in this assessment has been clearly stated.	Paragraph 8.4.10.
	What hours of operation have been used in the air quality assessment	The assessment has used a yearly operating profile of 8,760 hours (i.e. continuous operation) This is the same as the Consented Development.	Section 8.4.22 and Model Parameters, Table 8A.11(**Appendix 8A [Application Document Reference 6.4.6 – Air Quality Technical Appendix])**
	Embedded mitigation measures should be described	Embedded mitigation measures included in the Consented Development and Proposed Project have been detailed in this chapter.	Section 8.7

8.6 Future Baseline Conditions

Overview

8.6.1 This section presents the information used to evaluate the background and baseline ambient air quality in the area surrounding the Site (refer to **Figure 8.1 [Application Document Reference 6.3.12 – Air Quality Study Area – Health Receptors and Monitoring Locations] and Figure 8.2 [Application Document Reference 6.3.13 – Air Quality study Area – Ecological Receptors]** of this ES). The following steps have been taken in the determination of background contribution values. Where appropriate, the study focuses on data gathered in the vicinity of the Site:

- identification of AQMAs;
- review of Slough Borough Council ambient monitoring data;
- review of data from data from Defra's Automatic Urban and Rural Network (AURN);
- review of other monitoring undertaken in the area around the Site; and
- review of background data and Site relevant Critical Loads from the APIS website.

Air Quality Management Areas

8.6.2 Slough Borough Council has four AQMAs declared due to breaches of the annual mean NO_2. The AQMAs within 2km of the site are listed below:

- Slough AQMA No.3 Extension, incorporating a stretch of road between Tuns Lane Junction, known as "Three Tuns", and 30 Bath Road and Quadrivium Point, located 1.4km south-east of the Proposed Project.
- Slough AQMA No.1, encompassing land adjacent to the M4 motorway, which is situated 1.8km south of the Proposed Project.
- Slough AQMA No. 4, incorporating the A4 Bath Road from the junction with Ledgers Road/Stoke Poges Lane, east along Wellington Place up to Sussex Place Junction, which is 2 km south-east of the Proposed Project.

8.6.3 Nearby there are other local authority air quality management areas, which are listed below:

- 2.8 km to the south-west of the Proposed Project there is the South Bucks AQMA.
- 4km to the south of the Proposed Project is the Windsor AQMA.
- 5.5km to the south-west of the Proposed Project is the Bray/M4 AQMA
- 5.7 km to the west of the Proposed Project there is the Maidenhead AQMA.

Local Authority Ambient Monitoring Data

Slough Borough Council

8.6.4 Slough Borough Council currently undertakes monitoring within Slough (SBC, 2021). SBC reports ten locations automatic monitoring locations for NO_2. The nearest NO_2 continuous monitors are approximately 1.6km away from the Proposed Project at Windmill and Salt Hill Park, Bath Road, Slough.

8.6.5 The majority of the monitoring locations are below the annual mean NO_2 objective of 40µg/m^3 for 2020. Monitoring within the nearest AQMA (No.3 Extension) indicates that concentrations of NO_2 are below the NO_2 objective, with concentrations at 37 to 39 µg/m^3 at two locations close to the A4/Bath Road, while at most sites concentrations are approximately 30 – 33 µg/m^3.

8.6.6 A summary of the pollutant concentrations obtained from continuous monitoring stations and automatic monitoring stations near to the Proposed Project operated by SBC are presented in Table 8.6.

Table 8.6: Summary of monitored annual mean concentrations of NO_2 within Slough Borough Council Administrative Area

Site Name	*National Grid Reference*	*Distance to Facility (km)*	*Annual Mean Concentration (µg/m^3)*		
			2018	*2019*	*2020**
Slough Windmill Bath Road	496527.95, 180171.02	1.6	42.05	39.22	26.99
Slough Salt Hill	496599, 180156	1.65	31	26.4	-
Slough Town Centre Wellington Street	498413, 179804	3.03	35.73	34.74	24.53
Slough Brands Hill London Road	501644, 177752	7.7	41.88	39.17	27.35
Slough Colnbrook	503537.46, 176831.46	8.2	21.81	24.52	16.31
Slough Lakeside 2	503950, 177650	9.33	27.44	27.60	19.10

** Due to depressed levels of economic activity during the COVID-19 pandemic, this assessment does not rely on monitoring data from 2020 and 2021 data has yet to be published by SBC.*

Defra Background Data

8.6.7 Defra's 2018-based background maps (Defra, 2022) are available at a 1x1km resolution for the UK for the years 2015 – 2030. These projections of pollution concentrations across England are available for NO_2, NO_X, PM_{10} and $PM_{2.5}$.

8.6.8 Background concentrations from the Defra 2018 based background maps are presented for the year 2018 in Table 8.7, taken for the grid square in which the Proposed Project is located for NO_X, NO_2, PM_{10} and $PM_{2.5}$. Background concentrations for SO_2, CO and benzene are not available for the most recent Defra maps. Therefore 2001 based background concentrations are presented in Table 8.7.

Table 8.7: Defra background concentrations for Proposed Project

Pollutant	*Background Concentration (µg/m³)*
NO_x	37.01
NO_2	24.05
PM_{10}	16.94
$PM_{2.5}$	11.70
SO_2	3.76
Benzene	0.80
CO	0.453

Project Specific Measurements

8.6.9 A diffusion tube survey was undertaken between December 2021 and March 2022, sampling NH_3, SO_2, NO_x and NO_2, with **Figure 8.1 [Application Document Reference 6.3.12 – Air Quality Study Area – Health Receptors and Monitoring Locations]** illustrating the sampling locations. A summary of the results are shown in Table 8.8 and Table 8.9. Concentrations of nitrogen dioxide have been annualised in line with the methodology set out in LAQM.TG(16) (Defra, 2016).

Table 8.8: Site Specific Measurements Data - Nitrogen Dioxide

Site ID	Grid Reference		Reported Concentrations (µg/m³)			Bias Adjusted Period Mean (µg/m³)	Annualised Mean (µg/m³)
	X	Y	Month 1 (23/12/21 – 24/01/22)	Month 2 (24/01/22 – 22/02/22)	Month 3 (22/02/22 – 24/03/22)		
DT1	495199	181526	32.4	12.5	6.9	14.5	17.0
DT2	495306	181504	28.2	6.6	8.2	12.1	14.1
DT3	495660	181404	22.3	10.5	10.5	12.1	14.2
DT4	496401	179934	34.2	14.0	13.8	17.3	20.3
DT5	496262	181909	27.4	9.9	15.8	14.9	17.4

Table 8.9: Site Specific Measurements Data – Oxides of Nitrogen, Ammonia, Sulphur dioxide

Site ID	Grid Reference		Substance	Reported Concentrations (µg/m^3)			Period Mean (µg/m^3)
	X	Y		Month 1 (23/12/21 – 24/01/22)	Month 2 (24/01/22 – 22/02/22)	Month 3 (22/02/22 – 24/03/22)	
DT6	495848.44	184747.55	NO_2	12.8	9.3	13.0	11.7
			NO	14.8	4.9	Missing	9.9
			NO_x	27.6	14.3	Missing	20.9
			NH_3	2.47	2.80	4.28	3.20
			SO_2	<1.40*	<1.52*	4.42*	2.40

* Below limit of detection for analytical method – limit is assumed to be the maximum concentration

Model Scenarios

8.6.10 The future baseline scenario has been modelled because the situation has changed from when the assessment was completed for the Consented Development. This new model utilises more up to date meteorological data, background data, as built scheme details for the Consented Development.

8.6.11 A separate model scenario was not required to represent a Consented Development (future baseline) with the Proposed Project scenario as there are no additional emissions from the modelled sources due to the Proposed Project.

8.6.12 The future baseline scenario is fully representative of the combined emissions from the Consented Development and the Proposed Project.

Summary of Background Contribution Data

8.6.13 The selected background concentrations for each of the pollutants considered within the assessment are listed in Table 8.10. Wherever possible local monitoring data has been used for the background contributions to baseline concentrations. If this was not possible then data was obtained from representative industrial sites using official national monitoring data from the relevant monitoring network, as listed in the table accordingly.

8.6.14 Where Defra data has been used in the assessment, short-term background concentrations have been calculated by multiplying the selected annual mean background concentration by a factor of two LAQM TG(16). For 24-hour PM_{10} background concentration the annual mean background concentration was multiplied by a factor of 1.5 as proposed in EA guidance. For these data, the values

for the grid square in which the stack lie are presented in Table 8.7, although concentrations applied to receptors vary according to which 1x1km grid square they lie in.

Table 8.10: Background contribution values selected for use in the modelled scenarios

Pollutant	*Background Contribution ($\mu g/m^3$)*		*Source*
	LONG-TERM	***SHORT-TERM***	
NO_2	24.05	48.10	Defra background value for 2018. Short-term concentration is 2 times long-term concentration.
NO_x	Varies, see results		From APIS. 2017-2019 average. 24-hour concentration is 1.5 times long-term concentration
PM_{10}	16.94	25.41	Defra background value for 2018. 24-hour concentration is 1.5 times long-term concentration
$PM_{2.5}$	11.70	17.55	Defra background value for 2018.
SO_2	3.76	7.52	Defra background value for 2001. Short-term concentration is double long-term concentration
Benzene	0.779	1.558	Defra background value for 2001. Short-term concentration is double long-term concentration
HCl	0.2	0.4	Background concentration from the UKEAP: Acid Gases & Aerosol Network - Stoke Ferry for 2015.
HF	0.003	0.006	Long-term background concentrations from EPAQS. Short-term concentration is double long-term concentration.
CO	129	258	Defra background value for 2001. Short-term concentration is double long-term concentration
Total PAH	8.23×10^{-4}	-	Measured concentration from Defra PAH Network -Scunthorpe Low Stanton for 2017
B[a]P	8.23×10^{-4}	-	Measured concentration from Defra PAH Network -Scunthorpe Low Stanton for 2017
Pb	8.84×10^{-3}	-	Measured concentration from Defra Heavy Metals Network -London Cromwell Road for 2013

Pollutant	*Background Contribution ($\mu g/m^3$)*		*Source*
	LONG-TERM	***SHORT-TERM***	
Cd	1.5×10^{-4}	-	Measured concentration from Defra Heavy Metals Network -London Cromwell Road for 2013
Hg	2.0×10^{-3}	4.0×10^{-3}	Maximum monitored concentration at any urban industrial sites across the UK 2012 to 2016
Sb	7.8×10^{-4}	1.56×10^{-3}	Maximum monitored concentration at any urban industrial sites across the UK 2012 to 2016
As	8.55×10^{-4}	-	Measured concentration from Defra Heavy Metals Network -London Cromwell Road for 2013
Cr, as Cr (II) compounds and Cr (III) compounds	4.93×10^{-3}	9.86×10^{-3}	Measured concentration from Defra Heavy Metals Network -London Cromwell Road for 2013
Cu	3.54×10^{-2}	7.08×10^{-2}	Measured concentration from Defra Heavy Metals Network -London Cromwell Road for 2013
Mn	8.73×10^{-3}	1.75×10^{-2}	Measured concentration from Defra Heavy Metals Network -London Cromwell Road for 2013
Ni	1.80×10^{-3}	-	Measured concentration from Defra Heavy Metals Network -London Cromwell Road for 2013
V	1.48×10^{3}	2.96×10^{-3}	Measured concentration from Defra Heavy Metals Network -London Cromwell Road for 2013
NH_3	1.709	3.418	From APIS. Short-term concentration is double long-term concentration
PCBs	1.05×10^{-5}	2.10×10^{-5}	Measured concentration from Defra TOMPs Network - Manchester Law Courts for 2016 to 2017.
Dioxins and furans	1.2×10^{-5}	-	Measured concentration from Defra TOMPs Network - Manchester Law Courts for 2016 to 2017.

Predicted Future Baseline Conditions

8.6.15 The maximum hourly and annual mean predicted NO_2, PM_{10} and $PM_{2.5}$ concentrations have been compared with the AQALs, as summarised in Table 8.11 to Table 8.15; full concentrations are provided in Table 8A.13 in **Appendix 8A [Application Document Reference 6.4.6 – Air Quality Technical Appendix]**). The dispersion modelling includes a number of conservative assumptions in combination, including:

- use of the greatest magnitude contribution under any year of meteorological data modelled;
- operation of the plant at the proposed IED or BAT-AEL emission limits, whichever is tighter; in practice the actual operational emissions will have to be lower than these limits in order to ensure that the limits are adhered to; and
- conservative estimates of background concentrations at the sensitive receptors.

8.6.16 The following abbreviations are used in Table 8.11:

- Total: this is the Total Concentration and is the Consented Development process contribution plus the background contribution. It is the concentration expected at a particular receptor for the future baseline scenario; and
- AQAL: Air Quality Assessment Level

Table 8.11: Maximum predicted future baseline annual mean NO_2 concentrations at human health receptors

Receptor	Background Contribution ($\mu g/m^3$)	Consented Development Contribution ($\mu g/m^3$)	Total ($\mu g/m^3$)	*Total % AQAL*
R1	24.1	<0.1	24.1	60
R2	24.1	0.2	24.3	61
R3	24.1	0.4	24.5	61
R4	24.1	0.2	24.3	61
R5	24.1	0.1	24.2	60
R6	24.1	<0.1	24.1	60
R7	24.1	0.1	24.2	60
R8	24.1	0.1	24.2	60
R9	24.1	0.4	24.5	61
R10	24.1	0.6	24.6	62
R11	24.1	0.1	24.2	60
R12	24.1	0.1	24.2	60
R13	24.1	<0.1	24.1	60
R14	24.1	<0.1	24.1	60
R15	24.1	<0.1	24.1	60
R16	24.1	<0.1	24.1	60
R17	24.1	0.5	24.6	61

Receptor	Background Contribution ($\mu g/m^3$)	Consented Development Contribution ($\mu g/m^3$)	Total ($\mu g/m^3$)	*Total % AQAL*
R18	24.1	<0.1	24.1	60
R19	24.1	<0.1	24.1	60
R20	24.1	<0.1	24.1	60
R21	24.1	<0.1	24.1	60
R22	24.1	<0.1	24.1	60
R23	24.1	<0.1	24.1	60
R24	24.1	<0.1	24.1	60

Table 8.12: Maximum predicted future baseline 1 hour mean NO_2 concentrations at human health receptors

Receptor	*Background Contribution ($\mu g/m^3$)*	*Consented Development Contribution ($\mu g/m^3$)*	*Total ($\mu g/m^3$)*	*Total % AQAL*
R1	48.1	2.9	51.0	26
R2	48.1	10.4	58.5	29
R3	48.1	14	62.1	31
R4	48.1	12.4	60.5	30
R5	48.1	11.5	59.6	30
R6	48.1	12.1	60.2	30
R7	48.1	9.3	57.4	29
R8	48.1	7.8	55.9	28
R9	48.1	10.4	58.5	29
R10	48.1	13.3	61.4	31
R11	48.1	13	61.1	31
R12	48.1	13.3	61.4	31
R13	48.1	<0.1	48.1	24
R14	48.1	<0.1	48.1	24
R15	48.1	5.8	53.9	27
R16	48.1	7.5	55.6	28
R17	48.1	12.5	60.6	30
R18	48.1	4.7	52.8	26

Receptor	*Background Contribution (µg/m^3)*	*Consented Development Contribution (µg/m^3)*	*Total (µg/m^3)*	*Total % AQAL*
R19	48.1	0.4	48.5	24
R20	48.1	1	49.1	25
R21	48.1	0.7	48.8	24
R22	48.1	6.7	54.8	27
R23	48.1	7.6	55.7	28
R24	48.1	<0.1	48.1	24

Table 8.13: Maximum predicted future baseline annual mean PM_{10} concentrations at human health receptors

Receptor	Background Contribution ($\mu g/m^3$)	Consented Development Contribution ($\mu g/m^3$)	Total ($\mu g/m^3$)	*Total % AQAL*
R1	16.9	<0.1	16.9	42
R2	16.9	<0.1	17	42
R3	16.9	<0.1	17	42
R4	16.9	<0.1	17	42
R5	16.9	<0.1	16.9	42
R6	16.9	<0.1	16.9	42
R7	16.9	<0.1	16.9	42
R8	16.9	<0.1	16.9	42
R9	16.9	<0.1	17	42
R10	16.9	<0.1	17	42
R11	16.9	<0.1	16.9	42
R12	16.9	<0.1	16.9	42
R13	16.9	<0.1	16.9	42
R14	16.9	<0.1	16.9	42
R15	16.9	<0.1	16.9	42
R16	16.9	<0.1	16.9	42
R17	16.9	<0.1	17	42

Receptor	Background Contribution ($\mu g/m^3$)	Consented Development Contribution ($\mu g/m^3$)	Total ($\mu g/m^3$)	*Total % AQAL*
R18	16.9	<0.1	16.9	42
R19	16.9	<0.1	16.9	42
R20	16.9	<0.1	16.9	42
R21	16.9	<0.1	16.9	42
R22	16.9	<0.1	16.9	42
R23	16.9	<0.1	16.9	42
R24	16.9	<0.1	16.9	42

Table 8.14: Maximum predicted future baseline 24 hour mean PM_{10} concentrations at human health receptors

Receptor	Background Contribution ($\mu g/m^3$)	Consented Development Contribution ($\mu g/m^3$)	Total ($\mu g/m^3$)	*Total % AQAL*
R1	25.4	<0.1	25.4	51
R2	25.4	0.2	25.6	51
R3	25.4	0.5	26	52
R4	25.4	0.3	25.7	51
R5	25.4	0.1	25.5	51
R6	25.4	<0.1	25.5	51
R7	25.4	0.2	25.6	51
R8	25.4	0.2	25.6	51
R9	25.4	0.5	25.9	52
R10	25.4	0.7	26.1	52
R11	25.4	0.1	25.5	51
R12	25.4	0.2	25.6	51
R13	25.4	<0.1	25.4	51
R14	25.4	<0.1	25.4	51
R15	25.4	<0.1	25.5	51
R16	25.4	0.1	25.6	51
R17	25.4	0.6	26	52

Receptor	Background Contribution ($\mu g/m^3$)	Consented Development Contribution ($\mu g/m^3$)	Total ($\mu g/m^3$)	*Total % AQAL*
R18	25.4	0.1	25.5	51
R19	25.4	<0.1	25.4	51
R20	25.4	<0.1	25.4	51
R21	25.4	<0.1	25.4	51
R22	25.4	<0.1	25.5	51
R23	25.4	<0.1	25.5	51
R24	25.4	<0.1	25.4	51

Table 8.15: Maximum predicted future baseline annual mean $PM_{2.5}$ concentrations at human health receptors

Receptor	Background Contribution ($\mu g/m^3$)	Consented Development Contribution ($\mu g/m^3$)	Total ($\mu g/m^3$)	*Total % AQAL*
R1	11.7	<0.1	11.7	47
R2	11.7	<0.1	11.7	47
R3	11.7	<0.1	11.7	47
R4	11.7	<0.1	11.7	47
R5	11.7	<0.1	11.7	47
R6	11.7	<0.1	11.7	47
R7	11.7	<0.1	11.7	47
R8	11.7	<0.1	11.7	47
R9	11.7	<0.1	11.7	47
R10	11.7	<0.1	11.7	47
R11	11.7	<0.1	11.7	47
R12	11.7	<0.1	11.7	47
R13	11.7	<0.1	11.7	47
R14	11.7	<0.1	11.7	47
R15	11.7	<0.1	11.7	47
R16	11.7	<0.1	11.7	47

Receptor	Background Contribution ($\mu g/m^3$)	Consented Development Contribution ($\mu g/m^3$)	Total ($\mu g/m^3$)	*Total % AQAL*
R17	11.7	<0.1	11.7	47
R18	11.7	<0.1	11.7	47
R19	11.7	<0.1	11.7	47
R20	11.7	<0.1	11.7	47
R21	11.7	<0.1	11.7	47
R22	11.7	<0.1	11.7	47
R23	11.7	<0.1	11.7	47
R24	11.7	<0.1	11.7	47

8.6.17 The predicted total annual mean concentration of NO_2 for the future baseline scenario ranges between 24.1µg/m^3 and 24.6µg/m^3 which represents 60% to 62% of the AQAL. For the short term 99.79th percentile of 1 hour mean concentrations of nitrogen dioxide the maximum value, at any receptor (R10), of 62µg/m^3 represents 31% of the AQAL. As the predicted concentrations at these receptors are less than 75% of the AQAL it is reasonable to consider that the relevant air quality objectives are not at risk of being exceeded at these locations.

8.6.18 The future baseline conditions with respect to concentrations of particulate matter achieve the AQAL by a greater margin than is predicted for nitrogen dioxide. Annual mean concentrations of PM_{10} and $PM_{2.5}$ represent 42% and 47% of the AQAL respectively and the 90.41st percentile of 24 hour mean values is 51% of the AQAL. The risk of air quality objectives being exceeded in the future baseline scenario is considered to be low.

Other Pollutants

8.6.19 For the majority of the other pollutants (refer to **Appendix 8A (Appendix 8A [Application Document Reference 6.4.6 – Air Quality Technical Appendix])**the model predictions demonstrate that the future baseline is negligibly different to background pollutant contribution and/or represents a small percentage of the AQAL for all pollutants apart from VOC (as benzene), Cd, As, Cr VI, Mn, Ni and PAH.

Table 8.16: Summary of Environmental Concentrations

Pollutant	Averaging Period	Most Impacted Receptor	Background Contribution (µg/m^3)	Consented Development Contribution (µg/m^3)	Total (µg/m^3)	Total as % of AQAL
SO_2	Annual Mean	R10	3.76	0.3	4.0	8
	900s	R11	7.52	21.9	29.4	11
	1h	R3	7.52	19.8	27.3	8
	24h	R10	7.52	11	18.6	15
Benzene	Annual Mean	R10	0.779	0.07	0.85	16.9
HCl	1h	R15	0.4	8.3	8.7	1.16
HF	Monthly* Mean	R10	3 x 10^{-3}	0.03	0.03	0.18
	1h	R15/R23	6 x 10^{-3}	0.14	0.15	0.09
CO	8h	R3	129	13.5	142.5	1.4
	1h	R15	258	20.7	278.7	0.9
Total PAH	Annual Mean		8.23 x 10^{-4}			

Pollutant	Averaging Period	Most Impacted Receptor	Background Contribution (µg/m^3)	Consented Development Contribution (µg/m^3)	Total (µg/m^3)	Total as % of AQAL
B[a]P	Annual Mean	R10	8.23×10^{-4}	7.2×10^{-5}	8.95×10^{-4}	357
Pb	Annual Mean	R10	8.84×10^{-3}	2.0×10^{-3}	0.01	4.34
Cd	Annual Mean	R10	1.5×10^{-4}	1.4×10^{-4}	2.9×10^{-4}	5.7
Hg	Annual Mean	R10	2.0×10^{-3}	1.4×10^{-4}	2.1×10^{-3}	0.9
	1h	R15	4.0×10^{-3}	2.8×10^{-3}	6.8×10^{-3}	0.1
Sb	Annual Mean	R10	7.8×10^{-4}	2.0×10^{-3}	2.8×10^{-3}	0.06
	1h	R5/R22/ R23	1.56×10^{-3}	0.04	0.04	0.03
As	Annual Mean	R10	8.55×10^{-4}	2.2×10^{-3}	3.0×10^{-3}	100.2
Cr, as Cr (II) compounds and Cr (III) compounds	Annual Mean	R10	4.93×10^{-3}	2.0×10^{-3}	0.01	0.14
	1h	R5/R15/ R22/R23	9.86×10^{-3}	0.04	0.05	0.03
Cr (VI)	Annual Mean	R10	9.87×10^{-4}	6.0×10^{-7}	9.87×10^{-4}	493
Cu	Annual Mean	R10/R17	3.54×10^{-2}	2.1×10^{-3}	0.04	0.37
	1h	R2/R5/R 15/ R22/R23	7.08×10^{-2}	0.04	0.11	0.06
Mn	Annual Mean	R10	8.73×10^{-3}	1.9×10^{-3}	0.01	7.2
	1h	R15/R22/ R23	1.75×10^{-2}	0.04	0.06	<0.01
Ni	Annual Mean	R10	1.80×10^{-3}	2.1×10^{-3}	3.9×10^{-3}	19.3
V	Annual Mean	R10	1.48×10^{3}	1.9×10^{-3}	3.4×10^{-3}	0.07
	1h	R15	2.96×10^{-3}	0.04	0.04	4.4

Pollutant	Averaging Period	Most Impacted Receptor	Background Contribution (µg/m^3)	Consented Development Contribution (µg/m^3)	Total (µg/m^3)	Total as % of AQAL
NH_3	Annual Mean	R10/R17	1.709	0.03	1.74	0.97
	1h	R15	3.418	0.7	4.1	0.16
PCBs	Annual Mean	R10	1.05×10^{-5}	3.6×10^{-5}	4.6×10^{-5}	0.02
	1h	R15	2.10×10^{-5}	7.2×10^{-4}	7.4×10^{-4}	0.01
Dioxins and furans	Annual Mean	All	1.2×10^{-5}	4.3×10^{-10}	1.2×10^{-5}	N/A

Note: Highest value when using 10.5 or 12 MJ/kg fuel

* Using Weekly model outputs, as monthly averaging period not available.

8.6.20 Table 8.16 demonstrates that for all pollutants except total polycyclic aromatic hydrocarbons (PAH) represented as B[a]P, Arsenic (As), Chromium VI (Cr(VI)), the predicted concentrations for the future baseline scenario are well below the AQAL values. The EA's method for consideration of these pollutants is set out in **Appendix 8A [Application Document Reference 6.4.6 – Air Quality Technical Appendix]**), paragraph 8.6.21. This explains how taking into account the magnitude of background contributions and the margin by which similar facilities to the Consented Development achieve emission limit values under real world conditions are taken into account. This is necessary as the conservative nature of the assessment results in overestimations of total concentrations for these three pollutants.

Emissions of Odour

8.6.21 Several potential odour release sources have been identified; predominantly around the use of the Waste Derived Fuel (WDF). Some of the process residues, chemicals and reagents which are required to mitigate operational stack emissions are also a potential source of odour if experienced at high concentrations. The Consented Development contains a number of measures to ensure the appropriate control of odour from WDF on site. These measures are set out below.

8.6.22 Odours from the storage of WDF will be contained within the main building due to the negative pressure maintained by drawing air from the fuel reception and WDF storage bunker into the combustion process. Air from within the building envelope is used as feed air to the combustion plant, which ensures destruction of odorous compounds before they are emitted to atmosphere. During normal operations, therefore, odour emissions from the Consented Development are unlikely to occur.

8.6.23 Other control measures to minimise odour include various good housekeeping measures including: the cleaning of storage areas on a regular basis, monitoring odour, storing flue gas treatment (FGT) residues in sealed containers, loading FGT residues to tankers using sealed systems, storing reagents in sealed containers, and recording and investigating odour issues. These measures represent BAT for the control of odours from the Consented Development.

8.6.24 In the event that primary odour control measures (e.g., negative pressure and odour destruction by combustion) require additional support, odour suppression, including mist spray odour suppression systems would be implemented as necessary. Personnel will be trained in how and when to use the odour suppression system.

8.6.25 During planned maintenance, it is common for only one of the two lines to be shut down at a time, leaving the other line to draw feed air from within the building envelope. When both combustion lines need to be shut down, alternative mitigation can be implemented as outlined above.

8.6.26 Under normal operations, therefore, the containment measures built into the building design mean that fugitive odour emissions from the Consented Development would be unlikely to be perceptible at locations outside of the Site boundary and would not be significant. The proposed project does not introduce any new or different sources of odour emissions.

8.7 Embedded Design Mitigation

8.7.1 This section describes the embedded and good practice mitigation that has been incorporated into the Proposed Project design or assumed to be in place before undertaking the assessment. This embedded mitigation is necessary for the Proposed Project. Some of the embedded mitigation measures described in this ES are already secured as part of the Consented Development, and the DCO proposes to also require the Proposed Project to comply with them. This section may also identify some mitigation measures which are in place as part of the Consented Development and which are relevant to the topic being assessed, but which are not required for the Proposed Project and therefore are not 'embedded mitigation' for the purpose of the assessment of the Proposed Project. Such measures are described in order to provide context of the future baseline against which the Proposed Project is being assessed.

Construction

Construction Environmental Management Plan

8.7.2 Emissions of dust and particulates from the construction phase of the Proposed Project will be controlled in accordance with good working practices regularly employed in the construction industry, through incorporation of appropriate control measures according to the risks posed by the activities undertaken, as determined through this assessment process. The management of dust and particulates and

application of adequate mitigation measures will be enforced through existing embedding measures in the agreed Construction Environmental Management Plan (CEMP), as it is currently for the Consented Development (refer to **Appendix 2A [Application Document Reference 6.4.4 – Existing CEMP for Consented Development]** of this ES).

8.7.3 Good practice industry measures will already be in place for the Consented Development and incorporated into the Consented Development CEMP and will be applicable to the Proposed Project, albeit no new earthworks form part of the Proposed Project. Based on an initial assessment of the area of sensitivity to dust impacts and the likely risk of impacts arising from each of the key construction activities (e.g. construction and trackout of material onto roads) (refer to **Appendix 8A [Application Document Reference 6.4.6 – Air Quality Technical Appendix]**) appropriate embedded measures to be implemented during construction (good site techniques drawn from the 'high risk' site schedule in IAQM guidance) that have been identified and are existing measures included within the Consented Development CEMP (refer to **Appendix 2A [Application Document Reference 6.4.4 – Existing CEMP for Consented Development]** are:

- where appropriate, storage of sand and aggregates in bunded areas and storage of cement powder and fine materials in silos;
- use of water suppression and regular cleaning to minimise mud on roads;
- covering of vehicles leaving the construction site that are carrying construction waste materials or spoil;
- employment of a wheel wash system at site exits;
- restriction where practicable of the use of unmade road access; and
- prohibiting open fires on Site.

8.7.4 Good practice measures will also be employed through the existing Consented Development CEMP (refer to **Appendix 2A [Application Document Reference 6.4.4 – Existing CEMP for Consented Development])** for the siting and operation of Non-Road Mobile Machinery (NRMM) to control associated emissions, including where possible:

- minimising vehicle and plant idling; and
- locating static plant away from sensitive boundaries or receptors, in particular by retaining the existing landscaping around the Site.

Operation

IED/ BAT-AEL Emission Limit Value (ELV) Compliance

8.7.5 The Proposed Project will be designed as an additional element to work with the Consented Development such that process emissions to air comply with the ELV requirements specified in the IED. This will be regulated by the EA through the

Environmental Permit required for the operation of the facility as a whole (i.e., the Consented Development and the Proposed Project).

Stack Release Height

8.7.6 The release height for the Consented Development stack has been set at 90m (above ground level), in order to provide appropriate dispersion of the emitted pollutants. The Proposed Project will have no impact on the appropriate release height for the Consented Development stack, and given the limited pollutants emitted from the Proposed Project this stack height is not necessary to mitigate the impact of the Proposed Project.

8.8 Assessment of Likely Impacts and Effects

8.8.1 The assessment of effects takes place after considering embedded design mitigation.

Pollutants

Impacts on Human Health and Sensitive Ecosystems

8.8.2 The pollutants considered within the assessment of emissions for the main stack are primarily those prescribed within the IED (European Commission, 2010). These are:

- oxides of nitrogen (NOx), expressed as NO_2;
- particulate matter (as PM_{10} size fraction);
- carbon monoxide (CO);
- sulphur dioxide (SO_2);
- hydrogen chloride (HCl);
- hydrogen fluoride (HF);
- twelve metals (cadmium (Cd), thallium (Tl), mercury (Hg), antimony (Sb), arsenic (As), lead (Pb), chromium (Cr), cobalt (Co), copper (Cu), manganese (Mn), nickel (Ni) and vanadium (V));
- polychlorinated dibenzo-para-dioxins and polychlorinated dibenzo furans (referred to as dioxins and furans); and
- volatile organic compounds (VOCs), as a measure of total organic compounds.

8.8.3 Emissions of the following pollutants not included within the IED are also considered:

- the Polycyclic Aromatic Hydrocarbons (PAH), benzo[a]pyrene;
- ammonia (NH_3); and
- particulate matter (as $PM_{2.5}$ size fraction).

8.8.4 PAHs are produced as a result of incomplete combustion. One of the key PAH species, benzo[a]pyrene, is subject to an Air Quality Assessment Level in the UK. Ammonia is recognised as having the potential to impact on sensitive ecological habitats, both directly and as a component of acid and nutrient nitrogen deposition. The finer size fraction of particulate matter ($PM_{2.5}$) has increasingly become associated with impacts on health in recent years and has subsequently been included within the statutory limit values set out within the most recent European and UK air quality legislation.

8.8.5 Of the pollutants listed above, the primary pollutant of interest in relation to the impacts due to emissions from the Proposed Project is NO_2. The primary pollutant of concern for ecological impacts is NH_3.

Impacts on Amenity

8.8.6 'Dust' is defined in the IAQM guidance (IAQM, 2014) as solid particles that are suspended in air, and can give rise to soiling, and to human health and ecological effects, and is not solely defined by particle size. The definition set out in the IAQM guidance has been used in this assessment.

8.8.7 Odour could be generated through the receipt and handling of waste materials at the Site for use associated with the Proposed Project. The presence of an odour may or may not cause annoyance and depends on a number of factors that vary between individuals. Odour events may only last a few seconds but could cause annoyance if they frequently recur or are perceived to be particularly offensive.

Construction

Assessment of Construction Dust

8.8.8 The area sensitive to dust soiling and PM_{10} health effects has been assessed, as detailed in **Appendix 8A [Application Document Reference 6.4.6 – Air Quality Technical Appendix]**) of this ES, from the sensitivity of receptors and the proximity of the Proposed Project activities to these receptors.

8.8.9 The scale and nature of activities have been estimated to define the potential uncontrolled dust generation magnitude, according to the criteria outlined in Table 8A.3 of **Appendix 8A [Application Document Reference 6.4.6 – Air Quality Technical Appendix]**) of this ES. This assessment is only considering the Proposed Project impacts against the future baseline of the Consented Development construction. The only expected external amendment to the Consented Development associated with the Proposed Project will be the presence of one new, additional pipe, 18m above ground level. The 250mm diameter, 20m length pipe will be located alongside other pipes of similar dimensions in the same location and within the same pipe rack which form part of the Consented Development.

8.8.10 Estimates of the likely scale of activities, with reference to the guidance magnitude definitions in Table 8A.3 (refer to **Appendix 8A [Application Document**

Reference 6.4.6 – Air Quality Technical Appendix]). have been made for the purposes of mitigation definition:

- No demolition or earthworks will be required; and
- Heavy Duty Vehicle (i.e., HGV) movements associated with construction would be 20 of vehicles spread over two months (see Chapter 7: Traffic and Transport [EN010129/APP/6.2]) of this ES. There would be an additional 1 or 2 minibuses per day.

8.8.11 According to IAQM criteria, the Site has been classified in terms of its potential for construction activities to generate emissions of dust as a 'small' site. In terms of the potential for the trackout of mud onto local roads, the Site has been classed as a 'small' site.

8.8.12 Potential dust impacts (pre-mitigation) have been assessed based on the receptor sensitivity and distance criteria outlined in Tables 8A.4 - 8A.8 (refer to **Appendix 8A [Application Document Reference 6.4.6 – Air Quality Technical Appendix]**) using professional judgement. The area sensitivity has been judged to be 'low' for dust soiling impacts from all activities and for sensitivity for human health impacts from PM_{10} releases from all activities, on account of the distance from the activity source to the receptors, and the existing low background concentration particulates (<24 µg/m^3).

8.8.13 The potential risks from emissions from construction activities associated with the Proposed Project (i.e., not taking into account the good practice measures set out in Section 8.7 previously) have been defined with reference to the magnitude of the potential emission and the sensitivity of the impact area, in accordance with the classification defined in Table 8A.8 of **Appendix 8A [Application Document Reference 6.4.6 – Air Quality Technical Appendix]**). The results are shown in Table 8.17.

Table 8.17: Risk of dust and particulates impacts (pre-mitigation)

Potential Impact	*Risk of impact from activity*			
	Pre-construc-tion Demolition	*Earthworks*	*Construction*	*Trackout*
Dust Soiling	No demolition	No Earthworks	Low risk	Low risk
Human Health PM_{10}	No demolition	No Earthworks	Low risk	Low risk
Ecology	No demolition	No Earthworks	Not applicable	Not applicable

8.8.14 The level of mitigation required to reduce dust and particulates from the construction activities to avoid significant impacts on receptors has been determined based on the above risk assessment, and indicative measures are outlined in Table 8.18 for the Proposed Project activities.

Table 8.18: Example mitigation for dust and particulates during construction phase

Activity	*Example mitigation based on risk level*	*Classification of residual risk of impact*	*Effect descriptor*
Construction	Medium/ low risk: avoid mechanical roughening of surfaces where possible;	Negligible	Not significant
Trackout	Medium/ low risk: use water suppression and regular cleaning to minimise mud on road; cover vehicles leaving the site with waste materials; employ wheel wash systems at site exits; restrict unmade road access where possible	Negligible	Not significant

8.8.15 The application of good practice controls and mitigation already employed for the Consented Development, which will also be employed for the Proposed Project, would reduce potential effects at receptors during Construction to a **not significant** level.

Operation

Assessment of Operational Emissions from the Stack on Nitrogen Dioxide Concentrations

8.8.16 The combustion process for the Consented Development is more efficient than was envisaged at the time of the planning application for that development. The additional heat recovered will be utilised by the Proposed Project to generate additional electrical power output. The temperature of the exhaust gases at the point of release to air remains the same as the Consented Development. The Proposed Project does not introduce any new emissions nor change the exhaust gas parameters compared to the future baseline scenario and therefore the impact

of the Proposed Project at all receptors is **no change** to long and short term concentrations at all human health and ecological receptors.

8.8.17 The effect of the Proposed Project on air quality sensitive receptors from stack emissions is **neutral** and not significant, in terms of the risk to human health and to sensitive features at designated ecological sites.

Emissions of Odour

8.8.18 The Proposed Project does not introduce any new odour sources onsite or change the intensity or nature of any predicted odour associated with the Consented Development.

8.8.19 There be will **no change** to odour and therefore the effect is not significant.

Decommissioning and Demolition

8.8.20 The decommissioning and demolition of the Proposed Project would happen at the same time as the Consented Development and would be indistinguishable from the impacts associated with the Consented Development. The relevant best practice mitigation measures for the time will be in place during any decommissioning and demolition works, and the surrounding environment and receptors at the time of decommissioning will be identified through due process and documented in a Demolition Environmental Management Plan for the Consented Development (conditioned under planning condition 22 and the Environmental Permit) and Proposed Project. No additional mitigation for decommissioning and demolition of the Proposed Project beyond such best practice is foreseen to be required at this stage to ensure no significant effects at any receptor location.

8.9 Additional Mitigation and Enhancement Measures

8.9.1 IAQM guidance (IAQM, 2014) recognises it may not be necessary to include any additional mitigation or enhancement measures, since mitigation for air quality is frequently embedded in the design.

8.9.2 As described earlier, the management of dust and particulates and application of adequate mitigation measures will be enforced through the existing Consented Development CEMP (**Appendix 2A**, **[Application Document Reference 6.4.4 – Existing CEMP for Consented Development]** and through application of appropriate mitigation according to the risk of dust emissions from Site activities as identified in this assessment.

8.9.3 The environmental effects from construction of the Proposed Project have been identified as not significant; therefore, no specific additional mitigation has been identified as necessary for the construction phase of the Proposed Project other than the measures outlined in Section 8.7 of this ES chapter.

8.9.4 The air quality assessment of operational impacts has assumed that the ELVs will be met for the operational plant as required under the IED as amended by the

revised BREF and in accordance with use of BAT under the environmental permitting regime. The environmental effects from operation of the Proposed Project have been identified as not significant at all human health receptors.

8.9.5 Further assessment of the predicted effects at ecological receptors and the determination of the significance of these effects has been undertaken – refer to **Chapter 10: Ecology [Application Document Reference 6.2.10- ES Chapter 10]** of this ES.

8.9.6 No specific additional mitigation has therefore been identified as necessary for the operation or decommissioning phases of the Proposed Project, other than the embedded mitigation measured outlined in Section 8.7 of this ES chapter.

8.10 Residual Effects and Conclusions

Construction

8.10.1 The air quality assessment of construction impacts assumes that the impact avoidance measures outlined within Section 8.7 of this chapter will be incorporated into the design of the Proposed Project, as they are standard good practice measures that are routinely applied across UK construction sites. No specific additional mitigation has been identified as necessary for the construction phase of the Proposed Project. No significant effects have been identified. The application of good practice controls and mitigation already employed for the Consented Development would reduce potential effects at receptors to a **not significant** level.

Operation

8.10.2 The air quality assessment of impacts at opening has assumed that the ELVs will be met for the operational plant as required and in accordance with use of BAT under the environmental permitting regime. No specific additional mitigation has been identified as necessary for the operational phase of the Proposed Project. The Proposed Project does not introduce any new emissions nor change the exhaust gas parameters compared to the future baseline scenario and therefore the impact of the Proposed Project at all receptors is **no change.**

8.10.3 The effect of the Proposed Project on air quality sensitive receptors from stack emissions is **neutral** and not significant, in terms of the risk to human health and to sensitive features at designated ecological sites. The Proposed Project does not introduce any new odour sources onsite or change those associated with the Consented Development.

Decommissioning and Demolition

8.10.4 Consistent with the approach taken to the assessment of construction, it has been assumed that relevant best practice mitigation measures would be in place during any decommissioning and demolition works. No specific additional mitigation has

been identified as necessary for the decommissioning and demolition phase of the Proposed Project at this stage and no significant effects have been identified.

8.11 Cumulative Effects

8.11.1 No cumulative effects are anticipated in respect of air quality during the construction and operational phases.

8.11.2 There are no cumulative schemes that have been identified in **Chapter 6 Environmental Impact Assessment Methodology** of this ES **[Application Document Reference 6.2.6 – ES Chapter 6]** within the study area or which may have impacts within the study area. The Slough Trading Estate has status as a Simplified Planning Zone ('SPZ') Scheme (2014-2024) which allows some demolition and construction activities without planning permission, as described in **Chapter 6 Environmental Impact Assessment Methodology [Application Document Reference 6.2.6 – ES Chapter 6]** of this ES. Taking into account that the Proposed Project is expected to have negligible effects or lead to no change, any impacts associated with SPZ schemes (should any occur) are not expected to interact with the Proposed Project to create significant cumulative effects.

8.12 References

Cambridge Environmental Research Consultants (CERC) (2017) *ADMS Roads Validation Papers*

Centre for Ecology and Hydrology and APIS (2022) *Critical Load Function Tool.* [Online]. [22 June 2022].

Department for Environment, Food and Rural Affairs (2003) *Analysis of the Relationship between 1-hour and Annual Mean Nitrogen Dioxide at UK Roadside and Kerbside Monitoring Sites.*

Department for Environment, Food and Rural Affairs (2003) *Local Air Quality Management Technical Guidance TG(03).*

Department for Environment, Food and Rural Affairs (2011) *The Air Quality Strategy for England, Scotland, Wales and Northern Ireland.*

Department for Environment, Food and Rural Affairs (2016) *Local Air Quality Management Technical Guidance (TG16).*

Department for Environment, Food and Rural Affairs (2018) *Magic Map Application.* [Online]. [15th February 2022].

Department for Environment, Food & Rural Affairs and Environment Agency (2021) *Air emissions risk assessment for your environmental permit*. [Online]. [Accessed 15th February 2022]

Department for Environment, Food and Rural Affairs (2019) *Clean Air Strategy 2019.* [Online]. [Accessed 15th February 2022].

Department of Energy and Climate Change (2011a) *Overarching National Policy Statement on Energy EN-1*.

Department of Energy and Climate Change (2011b). *National Policy Statement on Renewable Energy Infrastructure EN-3*

European Commission (2006) *Integrated Pollution Prevention and Control Reference Document on the Best Available Techniques for Waste Incineration, August 2006*

European Commission (2019) *Best Available Techniques (BAT) Reference Document on Waste Incineration Industrial Emissions Directive 2010/75/EU (Integrated Pollution Prevention and Control)*

Highways England (2019) *Design Manual for Roads and Bridges (DMRB), Sustainability & Environment, Appraisal, LA 105 Air Quality.*

Institute of Air Quality Management (2014) *Guidance on the assessment of dust from demolition and construction Version 1.1 dated 01/06/16.*

Institute of Air Quality Management (2016) *Guidance on the assessment of mineral dust impacts for planning.*

Institute of Air Quality Management (2017) *Land-Use Planning & Development Control: Planning for Air Quality v1.2.*

Ministry of Housing, Communities & Local Government (2021) *National Planning Policy Framework*

Ministry of Housing, Communities & Local Government (2021) *National Planning Practice Guidance.*