Connah's Quay Low Carbon Power

Environmental Statement Volume II
Chapter 8: Air Quality (Tracked)

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8.1 Introduction

Overview

1.1.1 This chapter of the Environmental Statement (ES) presents an assessment of the likely significant environmental effects of the Connah's Quay Combined Cycle Gas Turbine (CCGT) fitted with Carbon Capture Plant (CCP) (hereafter referred to as the Proposed Development) with respect to Air Quality during the construction, operation (including maintenance), and decommissioning phases of the Proposed Development. A description of the Proposed Development, including details of maximum parameters, is set out in **Chapter 4: The Proposed Development** (**EN010166/APP/6.2.4**).

1.2.1 **Figure 3-3: Areas Described in the ES** (**EN010166/APP/6.3**) identifies the different components of the Proposed Development which are referenced throughout this chapter.

1.3.1 This chapter is supported by the following figures in **EN010166/APP/6.3**:

- **Figure 3-3: Areas Described in the ES;**
- **Figure 8-1: Construction Phase Assessment – Air Quality Study Area and Baseline Monitoring Locations**;
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- **Figure 8-33: FEED 2 Unabated Scenario, Nitrogen Deposition Process Contribution (Grassland) (% of the CL), 2021 Meteorological Data.**

1.4.1 This chapter is supported by the following appendices in **EN010166/APP/6.4**:

- **Appendix 1-A: Scoping Report**;
- **Appendix 1-B: Scoping Opinion**;
- **Appendix 2-B: Scoping Opinion Responses**;
- **Appendix 7-A: Legislative, Policy and Guidance Framework for Technical Topics**;
- **Appendix 8-A: Baseline Air Quality Information**;
- **Appendix 8-B: Air Quality Construction Dust Risk Assessment**;
- **Appendix 8-C: Air Quality Traffic Emission Assessment**; and
- **Appendix 8-D: Air Quality Operational Assessment**.

Legislation, Policy and Guidance

1.5.1 Legislation, planning policy, and guidance relating to Air Quality and pertinent to the Proposed Development are listed in **Table 8-1**. Further detail regarding these can be found in **Appendix 7-A: Legislative, Policy and Guidance Framework for Technical Topics** (**EN010166/APP/6.4**).

Table 8-1: Legislation, Planning Policy, and Guidance relating to Air Quality

Type	Legislation, Policy and Guidance
Legislation	• Infrastructure Planning (Environmental Impact Assessment (EIA)) Regulations 2017 (Ref 8-1);

Type	Legislation, Policy and Guidance
	• The European Union Ambient Air Quality Directive 2008 (Ref 8-2); • The Air Quality Standards (Wales) Regulations 2010 (Ref 8-3); • The Air Quality Standards (Amendment) Regulations 2016 (Ref 8-4); • The European Union (Withdrawal) Act 2018 (Ref 8-5); • Environment Act 1995 (Ref 8-6); • The Air Quality (Wales) Regulations 2000 (Ref 8-7); • The Air Quality (Wales) (Amendment) Regulations 2002 (Ref 8-8); • The Air Quality Strategy 2007 (Ref 8-9); • Environment Act 2021 (Part IV) (Ref 8-10); • The Environment (Wales) Act 2016 (Ref 8-11); • The Environment (Air Quality and Soundscapes) (Wales) Act 2024 (note: at the time of writing, the $PM_{2.5}$ target has not been set) (Ref 8-12); • The National Emissions Ceilings Regulations 2018 (Ref 8-13); • Environmental Protection Act 1990 (Part III) (Ref 8-14); • Well-being of Future Generations (Wales) Act 2015 (Ref 8-15); • The Industrial Emissions Directive (IED) 2010 (Ref 8-16); • The Environmental Permitting (England and Wales) Regulations 2016 (the EPR) (Ref 8-17); • The European Birds Directive 2009 (Ref 8-18); • The Habitats Directive (Ref 8-19); • The Ramsar Convention (Ref 8-20); and • The Conservation of Habitats and Species Regulations 2017 (as amended) (the Habitats Regulations) (Ref 8-21).
National Planning Policy	• The Overarching National Policy Statement (NPS) for Energy (EN-1) (Ref 8-22); • NPS for Natural Gas Electricity Generating Infrastructure (EN-2) (Ref 8-23); • Planning Policy Wales (PPW) (Ref 8-24); and • Future Wales: The National Plan 2040 (Ref 8-25).
Local Planning Policy	• Flintshire County Council (FCC) Local Development Plan (LDP) (2015-2030) (Ref 8-26);
National Guidance	• The Clean Air Strategy 2019 (Ref 8-27); • The Clean Air Plan for Wales (Ref 8-28);

Type	Legislation, Policy and Guidance
	• BAT Reference Document (BREF) for Large Combustion Plants (LCP BAT Conclusions) (specifies the BAT-Associated Emission Levels (BAT-AELs)) (Ref 8-29); • Air Quality Modelling and Assessment Unit (AQMAU) recommendations for the regulation of impacts to air quality from amine-based post-combustion carbon capture plant. AQMAU-C2025-RP01 (Ref 8-30); • The Post-combustion Carbon Dioxide Capture: Best Available Techniques (Ref 8-31); • Toxicological advice on air pollutants Hazard Ranking of Substances for Development of EALs for Substance Emissions to Air from Carbon Capture Technologies (Ref 8-32); • Air Emissions Risk Assessment for your Environmental Permit Guidance (Risk Assessment Guidance) (Ref 8-33); • Environmental permitting: air dispersion modelling reports (Ref 8-34); • Post-combustion CO_2 capture: BAT (Ref 8-35); • BAT Review for New Build and Retrofit Post-Combustion Carbon Dioxide Capture Using Amine-Based Technologies for Power and CHP Plants Fueled by Gas and Biomass as an Emerging Technology under the IED for the UK (Ref 8-36); • AQMAU Proposed assessment method to include amines and degradation products in nutrient nitrogen deposition estimations at ecological sites AQMAU-C2600-RP01 (draft) (Ref 8-37); • Land-Use Planning & Development Control: Planning for Air Quality (IAQM/EPUK Guidance) (Ref 8-38); • IAQM: A guide to the assessment of air quality impacts on designated nature conservation sites (IAQM Nature Site Guidance) (Ref 8-39); • Guidance on the assessment of dust from demolition and construction (IAQM Construction Dust Guidance) (Ref 8-40); and • Defra LAQM Technical Guidance (TG22) (Ref 8-41).

8.2 Consultation and Scope of Assessment

Consultation

EIA Scoping Opinion

2.1.1 A request for an EIA Scoping Opinion was sought from the Secretary of State (SoS) through the Planning Inspectorate (PINS) in February 2024 as part of the EIA Scoping Process. The EIA Scoping Opinion was adopted on 20 March 2024 (**Appendix 1-B: Scoping Opinion** (**EN010166/APP/6.4**)).

2.2.1 Key issues raised in the EIA Scoping Opinion are summarised and responded to in **Appendix 2-B: Scoping Opinion Responses** (**EN010166/APP/6.4**). A summary of consultation undertaken in relation to the air quality assessment through the Scoping process is provided in **Table 8-2**.

Statutory Consultation

2.3.1 Statutory consultation was carried out in October to November 2024. **Table 8-3** provides a summary of the comments received during the Statutory Consultation process and how regard has been had to these within the DCO Application.

Targeted Consultation

2.4.1 Following Statutory Consultation changes were made to the heights of the proposed absorber stacks and HRSG stacks and the Applicant undertook further targeted consultation. This consultation included a Supporting Information Report which detailed the environmental considerations associated with these changes. This Targeted Consultation was held between Thursday 8 May to Friday 6 June 2025. Responses to this targeted consultation are presented in the **Consultation Report** (**EN010166/APP/5.1**) and **Table 8-4** below outlines how and where these comments have been addressed within this chapter of the ES.

Additional Technical Engagement

2.5.1 A Discretionary Planning Advice (DPA) Application has been prepared and submitted to Natural Resources Wales (NRW) regarding the assessment of impacts on ecological receptors. At the time of submission, no feedback regarding air quality has been received in relation to this DPA.

2.6.1 FCC were contacted prior to the baseline air quality survey to inform them of planned locations. No comments were received from FCC regarding the baseline air quality survey.

2.7.1 A summary of consultation undertaken outside of the EIA Scoping process and Statutory Consultation in relation to the air quality assessment is provided in **Table 8-5**.

Table 8-2: Scoping Opinion Responses

Comment ID	Consultee	Extract of comment	Response
3.1.1	PINS	'*[PINS] is content that the number of vehicle trips predicted for the 66 staff required at the site during operation and 14 Heavy Goods Vehicle (HGV) trips a day is unlikely to result in a significant effect on air quality. It is noted however that this is to increase to 230 Annual Average Daily Traffic (AADT) during years of maintenance. The Inspectorate, noting the response by [NRW] and recognising that there is the potential for in-combination/ cumulative effects and impacts on future baseline as a result of other Proposed Developments within the vicinity of the site, deem that further information is required on the likely effects before this matter can be scoped out for air quality. The Applicant is encouraged to discuss this and seek agreement from relevant consultation bodies.*'	Cumulative traffic flow data has been used to inform detailed modelling assessments of the future baselines (construction and operation). Further information can be found in **Chapter 10: Traffic and Transport** (**EN010166/APP/6.2.10**) and **Chapter 24: Cumulative and Combined Effects** (**EN010166/APP/6.2.24**).
3.1.2	PINS	'*The ES should provide justification for not following the suggested distance of 350 m from the boundary of the site and up to 500 m from the site entrance for human receptors and 500 m from the site entrance for ecological receptors. These distances are set out in the Institute of Air Quality Management (IAQM) Guidance on the assessment of dust from demolition and construction 2014. The ES should ensure that any distances used have been informed by potential for significant effects on sensitive receptors and not an arbitrary figure assigned to the assessment.*'	The Institute of Air Quality Management (IAQM) Guidance on the assessment of dust from demolition and construction 2014 has been replaced with a 2024 update (v2.2) (Ref 8-40), which includes a different study area with a 250 m suggested distance for potential significant effects. The ES complies with this updated Guidance.
3.1.3	PINS	'*Paragraphs 6.4.8 – 6.4.10 of the Scoping Report outline the background data to be used in the assessment. This section also proposes a three-month survey using diffusion tubes to establish the nitrogen dioxide levels in the area immediately surrounding the*	An annualisation exercise will be undertaken to correct the period mean results obtained from the 3 months survey for seasonal bias.

Comment ID	Consultee	Extract of comment	Response
		site. As with all baseline information, the ES should justify how this is representative. It is not clear how this three-month survey period will be used to inform projections. Therefore, this approach should be fully justified in the ES.'	The annualisation methodology is detailed in **Appendix 8-A: Air Quality Information** (**EN010166/APP/6.4**), and includes details of the results used to inform background and/or verify traffic model outputs.
3.1.4	PINS	'*NRW raised in its representation that not all SSSI have been identified within the 15 km study area. The Applicant should seek to agree designated sites for inclusion in the assessment with relevant consultation bodies. The Applicant should ensure that all sites and species are included in the ecological assessment and listed in a table such as Scoping Report Table 9-3.*'	A study area of 15 km has been used to consider potential effects on all of the Sites of Special Scientific Interest (SSSIs) in proximity to the Proposed Development with details provided in the Preliminary Ecological Appraisal (PEA) included as Annex F of **Appendix 11-C: Botanical Technical Appendix** (**EN010166/APP/6.4**). SSSIs which have been identified to require further consideration within the ES are discussed within **Chapter 11: Terrestrial and Aquatic Ecology** (**EN010166/APP/6.2.11**). A 15 km radius is the standard distance set in NRW guidance for assessment of large combustion plant.
3.1.5	PINS	'*The Applicant should seek agreement with relevant consultation bodies that an assessment of the Proposed Development in unabated mode is not required to inform the worst-case assessment. This should be evidenced in the ES.*'	In Section 8.6 this assessment has considered the difference between the current baseline and three future scenarios. One of these scenarios

Comment ID	Consultee	Extract of comment	Response
			assesses Train 1 and Train 2 of the Proposed Development in unabated mode.
N/A	FCC	'*There are no AQMAs designated near the proposed site, and local air quality monitoring indicates that there are no exceedances of the UK air quality objectives near the site.* *During construction there is the potential for effects on air quality as a result of increased traffic movements and generation of dust from construction activities.* *The Council have reviewed the Scoping Report Document (Reference 60717119) and the proposed methodologies within in it and can confirm that we have no adverse comments to make in terms of pollution control.*'	This information on the air quality baseline is acknowledged. Consideration of the potential effects identified is located in Section 8.6 this assessment.
N/A	NRW	'*In general, we are satisfied that the proposed scope of the air quality assessment appears reasonable and appropriate for a development of this type. However, we have the following detailed comments.* *Paragraphs 6.4.8 – 6.4.10 outline the background data to be used in the assessment, this approach appears appropriate. This section also proposes a three-month survey using diffusion tubes to establish the Nitrogen Dioxide levels in the area immediately surrounding the site. This will give further confidence in the background data used in the assessment. However, it is not clear how this three-month measurement period will be projected to the annual statistical data requirements for background*	An annualisation exercise has been undertaken to correct the period mean results obtained from the three months survey for seasonal bias. This allows the data to representative of the whole year. This is detailed in **Appendix 8-A: Air Quality Information** (**EN010166/APP/6.4**).

Comment ID	Consultee	Extract of comment	Response
		measurements. Therefore, this approach should be fully justified in the ES.'	
N/A	NRW	'*Paragraph 6.4.11 does not include all the Sites of Special Scientific Interest (SSSIs) located within 15 km of the application site, as identified in Table 9-3 (Chapter 9) of the Scoping Report. We therefore advise that the air quality assessment considers all the SSSIs within 15 km, as identified within Table 9-3.*'	A study area of 15 km has been used to consider potential effects on SSSIs in proximity to the Proposed Development with details provided in the PEA included as Annex F of **Appendix 11-C: Botanical Technical Appendix** (**EN010166/APP/6.4**). All SSSIs within 15 km have been considered. SSSIs which have been identified to require further consideration within the ES are discussed within **Chapter 11: Terrestrial and Aquatic Ecology** (**EN010166/APP/6.2.11**).
N/A	NRW	'*Paragraph 6.5.2 states: "The Applicant's existing CCGT units at Connah's Quay Power Station will be on-site and operating during construction and potentially operating during periods coinciding with the operation of the Proposed Development. The existing Connah's Quay Power Station will therefore form part of the future baseline for the construction phase (which could commence in 2026 and last up to four years for Train 1 or combined single phase for Train 1 and Train 2) and potentially during the operational phase of the Proposed Development. Further information on the assumptions will be provided in the PEIR." This appears reasonable; however, we advise that an in-combination (i.e. existing power station plus proposed project) air quality assessment should also be completed.*'	A future scenario of the Proposed Development operating along with the existing CCGT units as set out in Section 2.2 of **Chapter 2: Assessment Methodology** (**EN010166/APP/6.2.2**) has been assessed within this assessment in Section 8.6.

Comment ID	Consultee	Extract of comment	Response
N/A	NRW	'*We note that the Amines Chemistry module developed by Cambridge Environmental Research Consultants (CERC) for ADMS 6 will be used in the assessment of N-amine impacts, with parameters developed in consultation with the project engineers and technology providers, this information will be presented in the ES. However, as full details have not been included in the Scoping Report, we are unable to comment further.*'	Full details of the model approach adopted has been included in this assessment and its supporting appendices (**EN010166/APP/6.4**).
N/A	NRW	'*We note that operational traffic emissions have been scoped out of the ES as the increase in operational traffic is less than the recognised screening criteria. Whilst the average predicted vehicle movements during operation outlined in paragraphs 6.7.2 and 6.7.3 fall below the 500 Annual Average Daily Traffic (AADT) threshold for Light Duty Vehicles (LDV), the figure quoted (230 AADT) is close to 50% of this threshold. The Deeside area is currently experiencing elevated development pressure, including other projects associated with the HyNet carbon capture scheme as well as the redevelopment of Shotton Paper Mill. Given this context we advise that it would be precautionary (and in line with the principles outlined in the Wealden judgement, 2017) to scope operational vehicle movements into the ES and to consider these in-combination with other plans and projects to assess whether a cumulative effect would give rise to an exceedance of the screening threshold.*'	A detailed assessment of operational traffic effects on local air quality, combined with stack emissions, has been included in the assessment presented in Section 8.6 and **Chapter 24: Cumulative and Combined Effects** (**EN010166/APP/6.2.24**).
N/A	Flint Town Council	'*On behalf of Flint Town Council, please find the below proposals to be put forward as a scoping opinion for the Environmental Statement.* *CO_2/CO/ NOx emissions from the site currently and projected after completion.*	The effects of the emissions referred to have been considered within the assessment presented in Section 8.6 of this chapter.

Comment ID	Consultee	Extract of comment	Response
		Particulate emissions from the site currently and projected after completion. *Predicted construction emissions in terms of machinery.*'	
N/A	Flint Town Council	'*Opportunities for innovative technologies zero carbon technologies for alternative fuels in the required vehicles as part of the construction phase to reduce the number of and impact of road haulage vehicles.*'	As detailed in the Framework **Construction Environmental Management Plan** (**CEMP**) (**EN010166/APP/6.5**), prior to construction of the Proposed Development, the Applicant would consider opportunities for zero/low emission construction/plant vehicles. This would include investigation of potential opportunities for alternative fuels in the required vehicles to reduce the impact of road haulage during the construction phase.

Table 8-3: Statutory Consultee Responses

Consultee	Comment	Response
FCC	*'The submitted environmental statement will need to have regard for [PPW] (edition 12, 2024) and any relevant legislation and guidance such as relevant Technical Advice Notes that is in force/adopted in Wales. Also the application should have regard to the respective and relevant policies within the Flintshire [LDP] adopted by the Council on 24 January 2023.'*	Legislation, planning policy, and guidance relating to Air Quality and pertinent to the Proposed Development are listed in **8-1**. This includes the policies listed by FCC. Further details regarding these can be found in **Appendix 7-A: Legislative, Policy and Guidance Framework for Technical Topics** (**EN010166/APP/6.4**).
FCC	'*Public Protection Flintshire County Council have confirmed that the applicants air quality report indicates that all relevant air quality standards will be met with no additional mitigation required.*'	This is noted.
Public Health Wales (PHW)	'*PHW suggest the inclusion of information on the preferred technology provider and selected technology to remove the carbon dioxide from emissions. These decisions will influence the likely operational emissions and effluents from the site, and consequently the need for any further mitigation or monitoring strategies. For example, post-combustion amine stripping in a dedicated carbon capture plant may require ammonia mitigation processes. These decisions will also impact on the nature of the waste produced by the plant.* *PHW note that, given the novelty of CCP technology in the United Kingdom, a recipient of the waste resulting from the proposed amine-stripping technology, such as nitrosamines, nitramine and ammonia, has not yet successfully been identified. The applicant should ensure that a suitable route for waste management exists and that the risks to human health of this route are fully explored.*'	Currently, there are two technology providers under consideration, both of which are in the process of undertaking FEED studies. In terms of potential impacts, a Rochdale envelope approach has been taken to ensure that the worst-case impact, based on information provided by the two FEED contractors, is considered in each topic area. Where the impacts are highly specific to the technology provider, which is the case for air quality, the assessment is presented for both cases and assessed based on the highest impact case.

Consultee	Comment	Response
UK Health Security Agency	'*We note that the applicant currently proposes that carbon dioxide capture would be facilitated through a method of post-combustion amine stripping although the capture technology choice is not yet confirmed at this stage and welcome their commitment to assess the potential impact of amine and amine degradation product emissions to atmosphere.* *We note that the applicant proposes to do this using Environmental Assessment Levels (EALs) for amines and amine degradation products. Our understanding is that amine stripping may involve some novel amines for which EALs are not available. Should this prove to be the case, at a later stage, we would expect to see an appropriate methodology for the assessment of these amines.*'	A detailed assessment of releases to air from the carbon capture process is included in the assessment presented in Section 8.6. Information on the EAL criteria used is detailed in Section 8.3.
UK Health Security Agency	'*It is recommended that the air quality impacts assessment also include the diesel-powered back-up generators and associated pollutants.*'	Precise information on the number, size and type of back-up generator(s) has not been confirmed at this stage of the Project. As a reasonable worst-case assumption, the diesel generator(s) would only be used for short periods during testing and in the case of an abnormal event. Their use is, therefore, unlikely to have a significant effect on local air quality.
UK Health Security Agency	'*It is noted that dust will be created as part of the construction work. The applicant may want to consider if a dust management plan is required within the Framework Construction Environmental Management Plan (CEMP).*'	This point is noted. The dust control measures to be employed during construction have been included in the **Framework CEMP** (**EN010166/APP/6.5**).
NRW	'*The following comments relate to the proposed air quality assessment methodology and the general suitability of key modelling assessment*	This point is noted. The air quality assessment methodology (detailed in Section 8.3) takes into account the points raised by NRW.

Consultee	Comment	Response
	parameters. We have not undertaken a review of the modelling files and as such cannot comment on the validity of the predicted concentrations. *Our comments refer to the elements of the assessment related to the potential impact on designated nature conservation sites. We have not reviewed the assessment of the impact of air emissions on human health or amenity.* *The use of air dispersion model ADMS in the assessment of operational emissions is considered appropriate.* *We note reference to APIS (Air Pollution Information System) when determining the background ambient concentration and deposition levels. APIS is an appropriate source of information for the use in the air quality habitats impact assessment.* *The construction dust assessment identifies that there are sensitive ecological receptors nearby and these are included in the construction dust assessment. The assessment references IAQM guidance, which is appropriate. The PEIR notes that the applied methodology differs slightly from the IAQM guidance, however justification for this is provided.* *Paragraph 1.3.54 of Appendix 8-D (Air Quality Operational Assessment) states: "For the purpose of assessment, the deposition velocity of amine species has been assumed to be equivalent to that of NH3." The applicant has assumed a deposition velocity for amine species equivalent to the ammonia deposition velocity. This approach is*	

Consultee	Comment	Response
	currently considered acceptable. Should guidance be published, prior to the submission of the final application, that provides specific deposition velocities for amines which are different to ammonia, then the assessment should be updated.'	
NRW	'*Paragraph 8.3.53 indicates that a number of operational scenarios have been modelled. However, only results from the most impacted scenario have been presented. We advise that the results from all potential operating scenarios should be included in the final application.*'	Section 8.6 includes an assessment of the findings of an unabated scenario and both FEED options for the carbon capture process.
NRW	'*Paragraph 1.2.7 of Appendix 8-D (Air Quality Operational Assessment) states "To assess the change in pollutant concentrations in the Study Area in more detail, a baseline scenario considering emissions from the existing Connah's Quay Power Station CCGTs under normal operating conditions, with all sources assumed to be operating for 21% of the year, has been included in this assessment." However, no justification for assuming a 21% operational scenario of the existing Connah's Quay Power Station CCGTs has been provided; this should be included in the final application.*'	The assumption of a 21% operational scenario is based on the Applicant's data on the recent historic use of the existing power plant (the average load factor from 2016-2023) and is considered to be robust enough for use in the assessment.
NRW	'*Predicted concentrations are presented from the proposed operation in isolation at receptors. Where the predicted impact from the proposal does not screen out as insignificant, the "change in PC" when considering the emissions from the existing Connah's Quay Power Station CCGTs is presented. We advise that the predicted impact from the existing Connah's Quay Power Plant should also be presented as a PC.*'	The predicted change in air quality statistics due to the operation of the proposed development is presented in the ES. Where the contribution made by the proposed development cannot be screened out, the predicted change in process contribution, accounting for the contribution made by the existing power station, is taken into account when determining the overall change.
NRW	'*We note that the ES will consider the potential cumulative impacts from emission sources which have either received, or may receive, planning*	A full cumulative assessment has been undertaken as part of this ES and is presented

Consultee	Comment	Response
	permission or other consent, but have yet to come into operation. At this stage, cumulative predicted concentrations have not been provided so we are unable to comment on these.'	in **Chapter 24: Cumulative and Combined Effects** (**EN010166/APP/6.2.24**)
NRW	*'Assumptions are made regarding ammonia emission concentrations due to ammonia slip. Satisfactory justification of ammonia emission concentrations due to ammonia slip should be provided in any future submission*.'	Ammonia emission concentrations have been provided by both FEED contractors for abated and unabated operation. The concentrations are significantly below the lower limit of the Large Combustion Plant BAT Associated Emission Levels range for ammonia of 3-10 mg/m^3. As such there is high confidence that these emission levels represent a high standard of slip control for both abated and unabated operation.
NRW	'*In the assessment of daily NOx (oxides of nitrogen) the applicant has derived the daily background by multiplying the annual background by a factor of 1.5. We note the claim that this was "advised by Natural Resources Wales on previous projects". However, guidance (Air emissions risk assessment for your environmental permit - GOV.UK) states that "When you calculate background concentration, you can assume that the short term background concentration of a substance is twice its long term concentration." Therefore, if you propose to use a different value you should provide detailed technical justification in the context of the specific proposed development.*'	In order to be consistent with the latest air emissions risk assessment guidance (Ref 8-33), a daily background concentration of twice the long term concentration has been used in the calculation of daily NO_X. The air emissions risk assessment guidance was prepared by the Environmental Agency to apply in England, however NRW have also adopted it to apply in Wales.

Table 8-4: Targeted Consultation

Consultee	Comment	Response
Flint Town Council	'*The introduction of ammonia emissions, not present in the existing power station, has caused grave concern among Council members regarding air quality, health, and safety.* *'Concerns were also raised about the adequacy of emissions modelling, particularly its application to sensitive receptors such as local schools, vulnerable residents, livestock, and soil quality. The Council expects:* • *Clear, independently verified air quality and dispersion modelling, made publicly available and understandable to the general public.* *A response to the question: What independent impact assessments have been conducted, and who commissioned them*?'	The small amounts of ammonia in the stack exhaust gas are assumed to be present because a Selective Catalytic Reduction (SCR) system may be required to reduce emissions of oxides of nitrogen (NO_X). The ammonia is used as a reagent in the abatement system to remove NO_X, the excess is known as ammonia slip and would therefore be emitted from the stack. In addition, trace amounts of ammonia can also be emitted as a degradation product from the carbon capture process. The impact of ammonia emissions to air have been considered within the scope of a detailed dispersion modelling assessment (see **Appendix 8-D: Air Quality Operational Assessment** (**EN010166/APP/6.4**)), undertaken by AECOM as part of the DCO application and environmental permitting processes. The significance of the effect of such emissions has been evaluated with reference to health-based standards for human health and habitat specific benchmarks for designated ecosystems.

Consultee	Comment	Response
Flint Town Council	'***5. Mitigation, Monitoring, and Compensation**: The Council expects:* • *Transparent, accountable mitigation strategies for all identified environmental risks—including noise and vibration (e.g., from pile driving) in relation to nearby Listed Buildings; and* • *Clear summaries of these assessments for public understanding.* *Full details of compensation mechanisms available to adversely affected residents and businesses, including:* • *How compensation will be calculated,* • *Who will administer the scheme,* • *How the public will be made aware of it.* *Additionally, the Council requests:* • *Clarification on how often the project's environmental performance will be reviewed, and how local residents will be kept informed of those findings.*'	Details of all mitigation and monitoring proposed is included within the **Commitments Register** (**EN010166/APP/6.10**).
Natural Resources Wales	'***Protected Sites:** The PEIR reported some potentially significant air quality impacts to protected sites, particularly from operational emissions of ammonia and nutrient nitrogen deposition (Nitrogen Oxides were close to screening out and acidity was also marginal), which will need to be considered in the ES and HRA. In-combination effects with other large developments in the area will also need to be considered'*.	The Air Quality assessment is presented **in Appendix 8-D: Air Quality Operational Assessment** (**EN010166/APP/6.4**) and is considered in Section 11.6 of **Chapter 11: Terrestrial and Aquatic Ecology** (**EN010166/APP/6.2.8**) as well as the **Report to Inform Habitats Regulations Assessment** (**EN010166/APP/6.12**).

Table 8-5: Additional Relevant Engagement

Consultee	Comment	Response
Natural England (NE)	'***Ecological Receptors*** *NE advise that the following internationally and nationally designated sites should be considered the key ecological receptors for air quality impacts in England:* • *Dee Estuary (Ramsar, Special Area of Conservation (SAC), Special Protection Area (SPA), and Site of Special Scientific Interest (SSSI));* • *River Dee and Bala Lake (SAC, SSSI);* • *Inner Marsh Farm (SSSI); and* • *Mersey Estuary (SPA, Ramsar, SSSI).* *Given the cross-border nature of potential impacts, it may be beneficial to identify mitigation approaches specifically aimed at reducing the risks of nitrogen and particulate deposition on sensitive sites in both Wales and nearby English areas.* *Any monitoring imposed as a requirement of a Development Consent Order (DCO) should include sites within England to assist cross-border compliance*.'	These sites are included in the assessment, as listed in Section 8.4.
NE	'***Distance thresholds*** *We concur that the correct distance criteria have been applied for air quality assessments*'	This position on the distance criteria is noted.
NE	'***Identification of potential pollutants and sources of emissions*** *We concur with the identification of NOx and NH_3 as emissions with relevance to vegetation and ecosystems in Table 8-3. We further note that nitrogen and acid deposition are identified as potential pollutants in Table 8-13. It should be noted that where other pollutants are identified,*	The Air Quality Modelling and Assessment Unit (AQMAU)'s Proposed assessment method to include amines and degradation products in nutrient nitrogen deposition estimations at ecological sites has been

Consultee	Comment	Response
	such as formaldehyde or MEA in Table 8-12, the impacts should be considered for qualifying features of designated sites, such as invertebrates. It is acknowledged that specific thresholds for ecological receptors for these pollutants do not exist, but there is potential for deposition and accumulation in sediments.'	followed to assess impacts from the carbon capture process on ecosystems.
NE	'***Backup or auxiliary power provisions*** *We note that the assessment does not specify backup or auxiliary power provisions that may be required. Such provisions may impact local air quality during operation or outages, therefore ensuring low-emission or battery backup systems would help limit local air quality impacts*.'	This point is noted. As noted above in response to NRW, precise information on the number, size and type of back-up generator(s) has not been confirmed at this stage of the project. The diesel generator(s) would only be used for short periods during testing and in the case of an abnormal event. Their use is therefore unlikely to have a significant effect on local air quality.
NE	'***Screening thresholds*** *It must be noted that the screening thresholds used (1% for long term and 10% for short term) must be applied alone and/ or in combination in order to screen from detailed assessment. That is, if a project alone generates <1% of the critical level (long term) for ammonia, it must be considered in combination with other plans and projects before being screened as insignificant/ no likely significant effect. This is to comply with case law on threshold use in air quality assessment*.'	This point is noted and applied in this assessment. The in-combination results are presented in **Appendix 8-C: Air Quality Traffic Emissions Assessment** and **Appendix 8-D: Air Quality Operational Phase Assessment** (**EN010166/APP/6.4**).
NE	'***Critical Loads and Levels*** *We note that Table 8-13 identifies critical loads and levels for relevant pollutants but does not allocate them for each ecological receptor or clarify what the most sensitive feature is considered to be. Detailed assessment, having ensured all emission sources and pollutants are considered, including in-combination assessment where relevant, should be undertaken in the ES and HRA*.'	The requested detailed assessment is included within the **Chapter 11: Terrestrial and Aquatic Ecology** (**EN010166/APP/6.2.11**) and **Report to Inform Habitat Regulation Assessment** (**EN010166/APP/6.12**).

Consultee	Comment	Response
NE	'***Impacts on supporting habitat*** *We note that the assessment has considered impacts on supporting habitat of designated site fauna. However, it is not clear which features are considered at each receptor, and whether this is the most sensitive qualifying feature*.'	Details on the sensitive qualitative features are included in **Chapter 11: Terrestrial and Aquatic Ecology** (**EN010166/APP/6.2.11**).
NE	'***In-combination assessment*** *We note that Chapter 24 provides a shortlist of schemes that may act in-combination, which includes committed developments with planning permission.* *It is unclear whether agricultural buildings, such as livestock housing, and allocations within local plans have been considered in this assessment, that may have cumulative impacts such as via traffic emissions*.'	Cumulative impacts via traffic emissions have been considered in the air quality assessment. The developments included in the traffic flows are listed in **Chapter 10: Traffic and Transport** (**EN010166/APP/6.2.10**).
NE	'***Road traffic*** *An assessment of emissions from road traffic should include consideration of NOx, NH_3, and nitrogen deposition (including the impact of ammonia) impacts to designated sites during construction, operation, and, if relevant, decommissioning*.'	Considerations of NH_3 emissions from road traffic and its deposition have been added to the ES.
NE	'***Appendix 8-C*** *We note that the traffic assessment has relied on a 2034 baseline. This should be justified. The Emission Factor Toolkit recommends not projecting beyond 2030 as predictions are less certain beyond that timescale*.'	The new Emission Factor Toolkit has been used in the ES. It now recommends not projecting beyond 2040 as predictions are less certain beyond that timescale.

Scope of the Assessment

2.8.1 Following the scoping process that has been undertaken, the scope of the assessment considered in this chapter is as follows:

- baseline - determination of the existing and future conditions;
- construction phase and decommissioning phase – consideration of fugitive emissions of dust and particulate matter;
- construction phase, operational phase and decommissioning phase - road traffic emissions, including emissions from Non-Road Mobile Machinery (NRMM); and
- operational phase - prediction of the impacts and effects of emissions to air from the power plant on human health and ecological receptors.

8.3 Assessment Methodology

3.1.1 This section outlines the assessment methodology to consider the effects associated with the potential emissions to air from construction, operation and decommissioning of the Proposed Development.

3.2.1 The magnitude of pollutant concentrations at receptor locations, resulting from emissions during the construction and operational phases of the Proposed Development have been predicted using atmospheric dispersion modelling techniques where appropriate, which enabled the assessment of the impacts associated with the Proposed Development on the existing local ambient air quality and, in particular, on the identified sensitive receptors.

Impact Assessment

3.3.1 The approach to the assessment for air quality follows the general process outlined in **Chapter 2: Assessment Methodology** (**EN010166/APP/6.2.2**). Potential impacts are assessed against the current and future baseline conditions as determined by available data and suitable modelling techniques, respectively.

3.4.1 The methodology for each assessment is outlined below. Unless otherwise stated, the general process for each assessment follows these steps:

- identify receptors within the appropriate study area for the Proposed Development;
- identify the magnitude of impact through consideration of the scale, duration and location of activities being carried out;
- for the dust risk assessment in particular, establish the sensitivity of the area through determination of the sensitivity of receptors and their distance from construction and decommissioning activities;
- identify development design and impact avoidance measures (for the dust risk assessment in particular, determine the appropriate level of control measures required based on the level of risk, to ensure there are no likely significant effects);

- determine the risk of likely significant effects on receptors occurring as a result of the magnitude of impact and the sensitivity of the area, assuming no additional mitigation (beyond what was determined in the previous step) is applied;
- determine the additional mitigation measures required, where necessary, in order to control impacts to an acceptable level; and
- summarise the residual effects of the mitigated works.

3.5.1 Details of the assessment methodologies are provided within **Appendices 8-A to 8-D** (**EN010166/APP/6.4**).

3.6.1 Additional details of the methodology applicable to the assessment of effects arising from air quality impacts on ecosystems are provided in **Chapter 11: Terrestrial and Aquatic Ecology** (**EN010166/APP/6.2.11**), whilst the methodology applicable for the assessment of air quality impacts on human health is provided in **Chapter 21: Human Health** (**EN010166/APP/6.2.21**).

Construction Dust Risk Assessment Methodology

3.7.1 The movement and handling of soils and spoil during construction activities for the Proposed Development is anticipated to lead 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 actual time and location of the work, and the nature of the activity being carried out.

3.8.1 At present, there are no statutory UK or EU standards relating to the assessment or control of dust. The emphasis of the regulation and control of construction dust, therefore, is through the adoption of Best Practicable Means (BPM) when working on-site to mitigate any potential impacts. 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.

3.9.1 The IAQM provides guidance for good practice and for qualitative assessment of risk of dust emissions from construction and demolition activities (Ref 8-40). The approach considers the risk of dust emissions from unmitigated activities to cause human health impacts (associated with PM_{10}), dust soiling impacts and ecological impacts (such as physical smothering and chemical impacts, for example, from the deposition of alkaline materials). The appraisal of risk has been based on the scale and nature of activities and on the sensitivity of receptors, and the outcome of the appraisal has been used to determine the level of good practice mitigation required for the adequate control of dust. Such measures have been incorporated into the **Framework CEMP** (**EN010166/APP/6.5**) that accompanies the Application and would be controlled via requirement of the DCO. A Final CEMP would be prepared in accordance with measures set out in the **Framework CEMP** (**EN010166/APP/6.5**). Details on the methodology and the assessment are presented in **Appendix 8-B: Air Quality Construction Dust Risk Assessment** (**EN010166/APP/6.4**).

Construction Site Plant Non-Road Mobile Machinery Assessment Methodology

3.10.1 There are likely to be emissions to air during construction activities arising from on-site construction plant or NRMM. The IAQM Construction Dust Guidance (Ref 8-40) 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.*'

3.11.1 Emissions from NRMM associated with the Proposed Development would be temporary and localised and would be controlled via the application of appropriate emissions standards and through best-practice mitigation measures – refer to Section 8.5. For these reasons, effects associated with construction phase NRMM emissions are highly unlikely to be significant and, therefore, have not been modelled.

Road Traffic Assessment Methodology

3.12.1 During the construction, decommissioning and operational phases of the Proposed Development, there is the potential for changes in traffic flows on the surrounding road network due to additional vehicles accessing the Construction and Operation Area to give rise to air quality effects at nearby sensitive receptors. The requirement to undertake a detailed assessment of road traffic emissions is based on the criteria set out in the IAQM/EPUK Guidance (Ref 8-38). It states that, when outside of an Air Quality Management Area (AQMA) (see Existing Baseline in Section 8.4), a detailed assessment is required if there is a predicted change in the annual average daily traffic of either:

- 500 Light Duty Vehicles (LDV, all vehicles less than 3.5 tonnes gross weight); or
- 100 Heavy Duty Vehicles (HDV).

3.13.1 Where road traffic emissions cannot be screened out and further assessment is considered necessary, concentrations of pollutants at sensitive human health receptors due to changes in traffic flows on the surrounding road network have been predicted using the Atmospheric Dispersion Modelling System (ADMS) Roads software package.

3.14.1 The incomplete combustion of fuel in vehicle engines results in the presence of combustion products of CO, PM_{10}, and $PM_{2.5}$ in exhaust emissions as well as hydrocarbons (HC) such as benzene and 1,3-butadiene. Similarly, the small amount of sulphur in ultra-low sulphur fuel can be converted to SO_2 that is then released to the atmosphere. In addition, at the high temperatures and pressures found within vehicle engines, some of the nitrogen in the air and the fuel is oxidised to form NOx, mainly in the form of nitric oxide (NO), which is then converted to NO_2 in the atmosphere. Better emission control technology and fuel specifications are expected to reduce emissions per vehicle across the UK vehicle fleet in the long term.

3.15.1 Although SO_2, CO, benzene, and 1,3-butadiene are present in motor vehicle exhaust emissions, detailed consideration of the associated impacts on local air quality management is not considered relevant in the context of the Proposed Development, as environmental concentrations are now so low that they are not priority pollutants for local air quality management. The risks to the attainment of the relevant air quality objectives in the vicinity of the Proposed Development are considered to be negligible, based on current emission rates for road vehicles. The emissions of SO_2, CO, benzene and 1,3-butadiene from road traffic are, therefore, not considered further within this assessment.

3.16.1 The exhaust emissions from road vehicles that have the potential to affect ambient concentrations of pollutants are NOx, NO_2, PM_{10} and $PM_{2.5}$. Therefore, the assessment of the significance of road traffic air quality effects as associated with the Proposed Development only considers these pollutants.

3.17.1 Six scenarios have been considered, with the future year chosen as the anticipated peak in additional traffic for each phase in order to present a robust assessment:

- current baseline (2023), representing the last complete calendar year prior to the assessment;
- future year without the Proposed Development construction (2034), representing future baseline conditions during the construction phase;
- future year with the Proposed Development construction (2034), representing future construction peak of month 36, under a simultaneous construction approach;
- future year with the Proposed Development construction (2034), representing future construction peak of month 36, under a simultaneous construction approach, but also including traffic from the existing power station needing maintenance;
- future year without the Proposed Development operation (2036), representing future baseline conditions in the first year of only operational (and maintenance) activities under all construction scenarios; and
- future year with the Proposed Development in operation (2036), representing future conditions in the first year of only operational (and maintenance) activities under all construction scenarios.

3.18.1 The current baseline has been used alongside a site-specific survey to verify the model against real life measurements.

3.19.1 Details on the methodology and the assessment are presented in **Appendix 8-C: Air Quality Traffic Emission Assessment** (**EN010166/APP/6.4**).

3.20.1 The anticipated number of Abnormal Indivisible Loads (AIL) would be 120 movements per train, across a two year period. Potential routes are discussed in **Chapter 10: Transport and Traffic** (**EN010166/APP/6.2.10**). The anticipated number of AIL movements during the construction period would not be capable of causing a perceptible change in air quality and are not considered further.

3.21.1 The future decommissioning baseline scenario is not included, as it is considered that the effects would be comparable to or lower than construction effects, particularly given the expected improvements in vehicle fleet emissions over that time.

Process Emissions from the Operational Plant Methodology

3.22.1 Emissions from the Proposed Development have been assessed using the EPR Risk Assessment Guidance (Ref 8-33) adopted by NRW, in order to identify where proposed emissions are unlikely to cause significant effects, and do not require more detailed assessment (termed screening out). For the purposes of this assessment, the first year of operation of both trains (referred to as opening) of the Proposed Development is assumed to be 2036, which is the earliest date that the Proposed Development could realistically start to operate at full load. Detailed dispersion modelling using the atmospheric dispersion model ADMS (currently ADMS 6.0.2), including the Amines Chemistry module, has been used to calculate the concentrations of pollutants at identified receptors. These concentrations have been compared with the defined Air Quality Assessment Level (AQAL) for each pollutant species, as summarised in **Table 8-6** to **Table 8-7**. The AQALs are health-based standards which are set at a level that would protect the most sensitive members of the population, hence all human receptors are considered to be of equal sensitivity.

3.23.1 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. **Appendix 8-D: Air Quality Operational Assessment** (**EN010166/APP/6.4**) details the model inputs for the assessment.

3.24.1 The assessment has considered the following future scenarios. There are two potential FEED providers with different technologies, hence the stack emission parameters for each option are different, therefore both have been assessed separately:

- operation of two CCGT Trains in unabated mode with the Front End Engineering Design (FEED) 1 Design, referred to as the "Unabated FEED 1 scenario". In this mode emissions would occur via the Heat Recovery Steam Generator (HRSG) stacks (abnormal temporary operating scenario e.g. periods when the CO_2 transport and storage system is not available);
- operation of two CCGT Trains in unabated mode with the Front End Engineering Design (FEED) 2 Design, referred to as the "Unabated FEED 2 scenario". In this mode emissions would occur via the HRSG stacks (abnormal temporary operating scenario e.g. periods when the CO_2 transport and storage system is not available);
- operation of two CCGT Trains with Single Absorbers for Carbon Capture with the FEED 1 Design, referred to as the "Abated FEED 1" scenario; and
- operation of two CCGT Trains with Single Absorbers for Carbon Capture with the FEED 2 Design, referred to as the "Abated FEED 2" scenario.

3.25.1 It has been assumed that the Proposed Development operates continuously (24 hours a day for 365 days a year) as this is considered to represent the reasonable worst-case scenario in terms of the annual average operational emissions, as detailed in **Appendix 8-D: Air Quality Operational Assessment** (**EN010166/APP/6.4**).

3.26.1 The conservative assessment of long-term (annual mean) and short-term (daily, 8-hourly, hourly and 30 minute mean) emissions resulting from the operation of the Proposed Development has been undertaken by comparing the maximum change in process contributions (PC) that occurs at any identified human health receptor, with the long-term and short-term AQAL, taking into consideration the baseline air quality, in accordance with the EPR Risk Assessment Guidance (Ref 8-33) adopted by NRW.

3.27.1 An assessment of the impact of nutrient nitrogen and acid deposition has been undertaken by applying published deposition velocities to the predicted annual average NO_2, NH_3 and amines concentrations at the identified statutory ecological sites, determined through dispersion modelling, to calculate deposition rates (expressed as kilograms per hectare per year, Kg/ha/yr and Keq/ha/yr). These deposition rates have then been compared to the Critical Loads for nitrogen and acidity published by UK Air Pollution Information System (APIS) (Ref 8-42), taking into consideration the baseline air quality.

3.28.1 Non-statutory designated sites (i.e. Local Wildlife Sites (LWS), Ancient Woodlands) have also been considered for both nutrient nitrogen and acid deposition, due to the proximity of these sites to the Proposed Development. For these sites, there is little data available with regards to habitat types present and the relevant Critical Loads Classes to be applied, and therefore PC have been considered against an assumed appropriate Critical Load determined for the appropriate habitat type, as informed by **Chapter 11: Terrestrial and Aquatic Ecology** (**EN010166/APP/6.2.11**).

3.29.1 An assessment of impacts from NO_x and NH_3 emissions on sensitive ecological sites was also carried out.

3.30.1 Modelling outputs used to assess ecological impacts are presented within this chapter, as well as in more detail in appendices **8-C: Air Quality Traffic Assessment** and **8-D: Air Quality Operational Assessment** (**EN010166/APP/6.4**) but determination of the significance of effects are included in **Chapter 11: Terrestrial and Aquatic Ecology** (**EN010166/APP/6.2.11**).

3.31.1 An assessment of cumulative impacts with other committed developments that could interact with the operational impacts and effects of the Proposed Development has been undertaken, including additional stack emissions as presented in **8-D: Air Quality Operational Assessment** (**EN010166/APP/6.4**). (see also **Chapter 24: Cumulative and Combined Effects** (**EN010166/APP/6.2.24**)).

3.32.1 A plume visibility assessment to determine how often the plume release from the stacks might be visible and how long the plume would be, is presented in **8-D: Air Quality Operational Assessment** (**EN010166/APP/6.4**).

3.33.1 Note that whilst there are well established Environmental Assessment Levels (EAL) for NO_2, CO and NH_3, the suite of EALs relating to amines and amine degradation products (nitrosamines and nitramines, collectively 'N-Amines' and formaldehyde) is much more limited. Previously the Risk Assessment Guidance (Ref 8-17) only included EALs for mono-ethanolamine (MEA) and N-nitrosodimethylamine (NDMA). The UK regulators have recently consulted on EALs for a wider range of amines and one additional nitrosamine. Following this consultation, EALs have been published in the risk assessment guidance for an additional five amine species and one additional nitrosamine species on 21 July 2025.

3.34.1 The FEED contractors have assisted in identifying appropriate EALs by providing information on the direct amine species which would be emitted from the process via the absorber stacks or formed in the atmosphere following emissions. The EALs applied have been derived from experimental data relating to the potential health impacts of the species emitted and/or read across from such data relating to species with published EALs which would be expected to have similar impacts based on structural or other similarity.

3.35.1 For nitrosamines and nitramines impacts have been assessed against the EAL for NDMA for all species. Based on the existing literature, NDMA is known to be one of the most toxic nitrosamine species and studies suggest that nitramines are substantially less toxic than their corresponding nitrosamines (Ref 8-43). As such, the use of the NDMA EAL is considered to represent a highly conservative assumption for the nitrosamine and nitramine species anticipated to be emitted or formed in the atmosphere from the FEED contractors' technologies.

3.36.1 The impacts of the individual amine species have been assessed against their respective EALs. For cumulative impacts, all direct amines emissions from the Proposed Development and other cumulative sources have been added together and assessed against the MEA EAL. This represents a conservative assumption as it is not established that the impacts of different amines would be cumulative. Similarly, the cumulative impacts of N-amine species have also been assessed against the EAL for NDMA.

Table 8-6: Adopted Air Quality Assessment Level – Protection of Human Health

Pollutant	Source	Concentration (µg/m³)	Measured As
Nitrogen Dioxide (NO_2)	National Air Quality Strategy Objectives	40	Annual mean
		200	1-hour mean, not to be exceeded more than 18 times a year
Particulate Matter (PM_{10})	National Air Quality Strategy Objectives	40	Annual mean
		50	24-hour mean, not to be exceeded more than 35 times a year

Pollutant	Source	Concentration (µg/m³)	Measured As
Particulate Matter ($PM_{2.5}$)	National Air Quality Strategy Objectives	20	Annual mean
Carbon Monoxide (CO)	National Air Quality Strategy Objectives	10,000	Maximum daily running 8-hour mean
NH_3	Risk Assessment Guidance (Ref 8-30) adopted by NRW	180	Annual Mean
		2,500	Hourly mean
Amines (as MEA)	Risk Assessment Guidance (Ref 8-30) adopted by NRW	400	Hourly mean
		100	24-hour mean
FEED 1 - Amine 1	Risk Assessment Guidance (Ref 8-30) adopted by NRW	400	Hourly Mean
		100	24-hour mean
FEED 1 - Amine 2	Risk Assessment Guidance (Ref 8-30) adopted by NRW	15	24-hour mean
FEED 2 – Amine 1	Risk Assessment Guidance (Ref 8-30) adopted by NRW	400	Hourly Mean
		100	24-hour mean
FEED 2 – Amine 2	Risk Assessment Guidance (Ref 8-30) adopted by NRW	15	24-hour mean
N-amines (as NDMA) Applied to: FEED 1 - Nitrosamine 1 FEED 1 - Nitrosamine 2 FEED 1 - Nitramine 1 FEED 1 - Nitramine 2	Risk Assessment Guidance (Ref 8-30) adopted by NRW	0.2 (ng/m³)	Annual Mean

Pollutant	Source	Concentration (µg/m³)	Measured As
FEED 2 - Nitrosamine 1 FEED 2 - Nitrosamine 2 FEED 2 - Nitramine 1 FEED 2 - Nitramine 2			
Formaldehyde	Risk Assessment Guidance (Ref 8-30) adopted by NRW	100	30 Minute Mean
		5	Annual Mean

Table 8-7: Adopted Air Quality Assessment Level - Protection of Vegetation and Ecosystems

Pollutant	Source	Concentration (µg/m³)	Measured As
Oxides of Nitrogen (NOx)	EU Air Quality Target Value	30	Annual mean
	UK Target Value	75	Daily mean
Ammonia (NH_3)	UK target value for lichen and bryophytes	1	Annual mean
	UK Target Value	3	Annual Mean

Evaluation of Significance – Construction Phase Dust Risk Assessment

3.37.1 For potential amenity effects, such as those related to dust deposition, the aim is to bring forward a Proposed Development, to include mitigation measures as necessary that minimise the potential for amenity, human health, and ecological impacts as a result of the Proposed Development construction works.

3.38.1 The IAQM/EPUK Guidance (Ref 8-38) 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 IAQM guidance indicates that application of appropriate mitigation should ensure that residual effects would normally be not significant. Such control measures are included in the **Framework CEMP** (**EN010166/APP/6.5**).

Evaluation of Significance – Traffic and Operational Emissions Assessment

3.39.1 The evaluation of the significance of air quality effects from the traffic and operational point sources has been based on the approach referenced in IAQM/EPUK guidance (Ref 8-38), and the criteria in the EPR Risk Assessment Guidance (Ref 8-30) adopted by NRW. The predicted changes in pollutant concentrations are compared to AQAL to determine the magnitude of change.

3.40.1 For a change of a given magnitude, the IAQM/EPUK Guidance (Ref 8-38) has published recommendations for describing the magnitude of long-term impacts at individual receptors and describing the significance (**Table 8-8**) of such impacts. This terminology has been changed where appropriate in order to maintain consistency with the rest of this ES – where the IAQM uses 'substantial' this has been changed to 'major', and 'slight' has been changed to 'minor'.

Table 8-8: Air Quality Impact Descriptors for Long Term Changes in Ambient Pollutant Concentrations

Long term averaging concentration at receptor	Percentage Change in Annual Mean Concentrations				
	Up to 0.5% Imperceptible	0.5 – 1% Very Low	2-5% Low	6-10% Medium	>10% 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 (National Air Quality Standard objectives or Environmental Assessment Level (EAL))

3.41.1 The IAQM/EPUK Guidance (Ref 8-38) is not explicit in the identification of whether any of the above impact descriptors should be considered significant or not significant effects, rather it indicates that the descriptors should be applied to individual receptors and a moderate adverse impact at one receptor may not mean that the overall impact has a significant effect; other factors need to be considered. However, it indicates further that negligible impacts are likely to lead to effects that are not significant and major impacts describe the potential for significant effects. The judgment of significance of effects adopted within this assessment is discussed below.

3.42.1 Guidance from the Environmental Permitting Regime uses a risk-based approach to identify when additional assessment is required to understand

whether or not significant effects are likely to occur. The Risk Assessment Guidance (Ref 8-30) adopted by NRW, includes risk assessment screening criteria to be used for comparison of PC with AQAL. An emission would not require further consideration where:

- short term PC <=10% of the AQAL; and
- long term PC <=1% of the AQAL.

3.43.1 Where an emission cannot be screened out from requiring more detailed consideration, the second stage of screening considers the PC in the context of the existing background pollutant concentrations; the predicted environmental concentration (PEC) is unlikely to cause a significant effect where:

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

3.44.1 The IAQM Nature Site Guidance (Ref 8-39) recommends the same assessment criteria as the Risk Assessment Guidance (Ref 8-30) in relation to impacts on SACs, SPAs, Ramsar and SSSIs. Where statutory sites do not screen out from the need for further assessment, conclusion on significance is provided by the project ecologists, and presented in **Chapter 11: Terrestrial and Aquatic Ecology** (**EN010166/APP/6.2.11**).

3.45.1 For non-statutory sites, such as LWS, the Risk Assessment Guidance (Ref 8-30) adopted by NRW identifies that where the short or long-term PC is less than 100% of the respective standard, then it can be concluded that there are unlikely to be significant effects due to changes in air quality without needing to assess the PEC.

3.46.1 In relation to LWSs and ancient woodland, the IAQM Nature Site Guidance recommends that such sites are screened using the same criteria as SACs, SPAs and SSSIs (i.e. 1% for long-term impacts and 10% for short-term impacts) but notes that the determination of significance of any effect may differ for LWSs. The IAQM Nature Site Guidance has been used for initial screening of all sites. Where LWSs do not screen out, the Risk Assessment Guidance (Ref 8-17) criteria have been considered, as long-established quantitative determinants of significance, together with advice provided by the project ecologists, to reach a conclusion on significance.

3.47.1 Where the PEC does not exceed the AQAL and the proposed emissions comply with the BAT-AEL (or equivalent requirements) the emissions are typically considered acceptable by NRW.

3.48.1 The IAQM/EPUK Guidance (Ref 8-38) indicates that the EPR Risk Assessment Guidance (Ref 8-30), adopted by NRW, threshold criterion of 10% of the short term AQAL is sufficiently small in magnitude to be regarded as likely to have an insignificant effect without the need for further assessment. The IAQM/EPUK Guidance deviates from the EPR Risk Assessment Guidance (Ref 8-30) (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 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 low in magnitude representing a 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.

3.49.1 For impacts on human health from emissions of NOx and particulates, the IAQM criteria displayed in **Table 8-8** have been used to assess long term impacts on individual sensitive receptors.

3.50.1 Short-term impacts on individual sensitive receptors from emissions of NOx, CO, PM_{10} and amines have been assessed using the criteria described in paragraph 3.48.1.

3.51.1 As amine degradation products (assessed against the NDMA AQAL) have a negligible background concentration and are emitted at an order of magnitude 1,000 times smaller than other pollutants, the IAQM criteria set out above are not deemed appropriate. As paragraph 6.27 of the IAQM/EPUK Guidance (Ref 8-38) notes that, the assessment may use its own set of criteria to define magnitude, but the important matter to be concluded is the likely significant effects of the impacts on air quality. It also references the number of significant figures to which concentrations should be reported and how it should *reflect the accuracy associated with predicted changes*. The evidence supporting the setting of the EAL for NDMA identifies that there are knowledge gaps and uncertainties in the current state of knowledge. This is reflected in the use of one significant figure for the reported EAL value. Results should only be presented with one significant figure, however in order to assist decision making a second significant figure has been included, with values rounded to the nearest 0.05 ng/m^3. The criteria used in this assessment for amine degradation products are as shown in **Table 8-9**.

Table 8-9: N-Amine Impact Descripteurs

	Change in Annual Mean Concentrations (ng/m^3)				
	Up To 0.05 Imperceptible	>0.05 to 0.1 Very Low	>0.1 to 0.15 Low	>0.15 to 0.2 Medium	>0.2 High
Effect descriptor at an individual receptor	Negligible	Negligible	Negligible	Minor	Moderate

3.52.1 For impacts on ecological sites from emissions of NOx, NH_3, amines and their associated deposition, the IAQM criteria set out in paragraph 3.44.1

have been used to assess long term impacts on individual sensitive receptors.

Evaluation of Significance – Proposed Development as a Whole

3.53.1 Following the assessment of each individual air quality effect (construction and decommissioning dust, construction, operational and decommissioning traffic, and operational emissions to air from the power plant), the significance of all of the reported effects is then considered for the Proposed Development in overall terms, recognising that construction dust and traffic would occur in the same time period, but that operational effects would occur at a later date. The potential for the Proposed Development to contribute to, or interfere with, the successful implementation of policies and strategies for the management of local air quality is considered if relevant, but the principal focus is any change to the likelihood of future achievement of the NAQS (which also relate to compliance with local authority goals for Local Air Quality Management (LAQM) and objectives set for the protection of human health).

3.54.1 In terms of the significance of the effects (consequences) of any adverse 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.

Rochdale Envelope

3.55.1 The setting of design parameters using the Rochdale Envelope approach is described in **Chapter 2: Assessment Methodology** (**EN010166/APP/6.2.2**). The maximum parameters for the principal components of the Proposed Development are set out in the **Design Principles Document** (**EN010166/APP/7.8**) and are illustrated on the **Works Plans** (**EN010166/APP/2.4**) and the **Parameter Plans** (**EN010166/APP/2.5**). These parameters, together with assumptions regarding the future plans for the existing Connah's Quay Power Station set out in **Chapter 2: Assessment Methodology** (**EN010166/APP/6.2.2**) have been used to inform the representative worst-case scenario that has been assessed in this chapter, in order to provide a robust assessment of the impacts and likely significance of environmental effects of the Proposed Development at its current stage of design.

3.56.1 In particular, focused use of the Rochdale Envelope has been adopted for the following aspects:

- building dimensions and positioning included within the assessment are based on available information within the concept design for the Proposed Development. Although there are limited layout options due to site constraints, exact building dimensions are not yet known. A conservative approach has been used by modelling maximum realistic dimensions, as larger buildings close to the stacks lead to more building downwash;

- different options for the construction and operational scenarios have been considered, as detailed in Table 2.1 in **Chapter 2: Assessment Methodology** (**EN010166/APP/6.2.2**); and
- the Proposed Development has been assumed to be running 24 hours a day, 365 days per year (8,760 hours per year) as a worst-case scenario (actual operation is expected to be lower than this and dispatchable, in response to demand). Assuming continuous operation throughout the year is considered to assess worst-case annual average air quality impacts.

Assessment Assumptions and Limitations

3.57.1 For the purposes of the assessment, the construction phase includes enabling (including demolition works) required to facilitate the Proposed Development. To complete a conservative assessment of potential effects, assumptions used include: monthly peak flows assumed for a full calendar year, for both construction (and decommissioning) and operational scenarios.

3.58.1 It is recognised that there is an inherent level of uncertainty in the dispersion modelling process. In order to minimise the potential for under-estimating the predicted impacts for the operational emissions, a number of conservative assumptions have been made for assessment purposes that differ from what is likely to occur. The basis for the assessment is as follows:

- continuous operation (i.e. for 8,760 hours per year) of the CCGTs and CCP for the Proposed Development when both Train 1 and Train 2 (or combined single phase) are developed (i.e. the Proposed Development is fully built out) represents the worst-case. In practice, the plant would operate in a dispatchable manner, with a load factor significantly lower and would require routine maintenance periods;
- emissions to air have been modelled at the maximum allowable limits from the BAT-AELs defined in the LCP BAT Reference Document (BREF) except where specific emission rates data has been provided by the FEED contractors;
- emissions of N-amine have been modelled using a number of robust assumptions, in order to provide a conservative assessment, these assumptions are detailed in Section 8.6;
- the assessment assumes continuity of mass between the emission point and receptor, with no depletion of plume concentrations due to wet or dry deposition;
- nitrogen deposition calculations apply the NO_2 deposition velocity to the whole NOx concentration (as NO_2). In practice the deposition velocity for the NO component is negligible in comparison with NO_2;
- assessment of air quality impacts based on the point of maximum impact across the modelled grid in addition to impacts at identified receptors; and

- the impact at each receptor has been reported based on the highest impact magnitude in any individual year for the meteorological conditions experienced in the last five years.

3.59.1 If the option to only build one train (Train 1 CCP stack and two of the existing CCGTs in operation) is chosen, emissions from the Proposed Development would be halved, as would (roughly) the impacts at receptors, especially for pollutants emitted by the Proposed Development but not the existing Connah's Quay Power Station (i.e. NH_3, amines and byproducts). Therefore the ES reports air quality impacts arising from emissions from both trains, using Rochdale Envelope principles.

3.60.1 The actual impacts in the future would be determined by the meteorological conditions and the activities undertaken at that time. This uncertainty is addressed through the use of conservative assumptions, for the inputs to the assessment, so that the air quality assessment represents a reasonable worst-case assessment process. The use of dispersion modelling is a widely applied and accepted approach for the prediction of impacts from industrial sources.

8.4 Baseline Conditions and Study Area

Study Area

4.1.1 The study area was defined to include air quality features likely to be at risk from possible direct and indirect impacts that might arise from the Proposed Development. The potential study area is considered to be 15 km from the Main Development Area, as per the EPR Risk Assessment Guidance (Ref 8-30).

4.2.1 To identify the relevant baseline for future operational assessment, a study area of 15 km from the Main Development Area (where operational emissions would arise) has been identified for statutory designated ecological sites i.e. SPAs, SACs, Ramsar sites (protected wetlands)) and SSSIs and of 2 km for non-statutory designated nature conservation sites (ancient woodlands, LWS and national and local nature reserves).

4.3.1 Regarding impacts on human health, the maximum impact of emissions to air from the operational Proposed Development would generally occur within 2 km of the stacks. Sensitive receptors for the human health impacts have been selected to represent impacts, both within this 2 km zone and further afield where appropriate. The air quality receptors in relation to human health encompass a range of residential (including a travelers' encampment) and educational receptors, as well as places of worship.

4.4.1 For the construction and decommissioning dust risk assessments, the study area is set as 250 m from the Construction and Operation Area and 50 m from access roads up to 250 m from the site entrances for potential impacts to human health and amenity; and 50 m from the Order limits and 50 m from access roads up to 250 m from the site entrances for potential impacts on relevant ecological sites. The study area criteria are in line with the current IAQM Construction Dust Guidance published in 2024 (Ref 8-40), which replaces the original 2014 guidance document.

4.5.1 For potential impacts due to changes in pollutant concentrations associated with changes in road traffic flows, the study area for potential impacts on sensitive receptors is 200 m from the road centreline of all road links in the affected road network.

4.6.1 Meteorological data to support air quality modelling have been sourced from the Met Office site at Hawarden Airport, located approximately 9 km south-east of the centre of the Main Development Area.

4.7.1 The selected representative receptors used in the air quality assessment for both human health and ecological receptors within the study area are presented in **Table 8-10** to **Table 8-12** and on **Figure 8-1: Construction Phase Assessment – Air Quality Study Area and Baseline Monitoring Locations, Figure 8-2: Operational Phase Assessment – Air Quality Study Area and Human Health Receptors** and **Figure 8-3: Operational Phase Assessment – Air Quality Study Area and Ecological Receptors** (**EN010166/APP/6.3**).

Table 8-10: Operational and Traffic Human Health Receptors

Receptor ID	X (m)	Y (m)	Description	Sensitive to Road Traffic Emissions?	Sensitive to Operational Stack Emissions?	Minimum Distance from the Proposed Development's Stacks (m)
R1	327170	371241	Residential, Kelsterton Road, Rockcliffe,CH6 5SJ*	Yes	Yes	220
R2	327152	371210	Residential, Chester Road, Oakenholt, CH6 5SJ	Yes	Yes	260
R3	326749	371070	Residential, Chester Road, Oakenholt, CH6 5SF	No	Yes	660
R4	327557	370826	Residential, Kelsterton Road, Rockcliffe, CH6 5TH	No	Yes	490
R5	327880	370743	Residential, Kelsterton Road, Rockcliffe, CH5 4BJ	Yes	Yes	700
R6	327972	370700	Residential, Connah's Quay, CH5 4BL	Yes	Yes	790
R7	328024	370545	School, Deeside College, York Road, Golftyn, CH5 4YE	No	Yes	950
R8	326371	371298	Residential, Papermill Lane, Oakenholt, CH6 5TD	No	Yes	950
R9	326452	370953	Residential, Oakenholt Lane, Oakenholt, CH6 5SX	No	Yes	970
R10	326048	371070	Residential, Leaderbrook Drive, Oakenholt, CH6 5ST	No	Yes	1,310
R11	325943	371334	Residential, Leaderbrook Drive, Oakenholt, CH6 5ST	Yes	Yes	1,370
R12	325928	371585	Residential, Leaderbrook Drive, Oakenholt, CH6 5ST	Yes	Yes	1,390

Receptor ID	X (m)	Y (m)	Description	Sensitive to Road Traffic Emissions?	Sensitive to Operational Stack Emissions?	Minimum Distance from the Proposed Development's Stacks (m)
R13	325967	371792	Residential, Leaderbrook Drive, Oakenholt, CH6 5ST,	Yes	Yes	1,390
R14	325966	371823	Residential, Chester Road, Oakenholt, CH6 5WF	Yes	Yes	1,400
R15	328454	370344	Residential, Church Street, Golftyn, CH5 4AS	Yes	Yes	1,380
R16	328381	370167	Residential, College View, Connah's Quay, CH5 4BY	No	Yes	1,460
R17	328213	370061	Residential, Golftyn Lane, Connah's Quay, CH5 4DT,	No	Yes	1,450
R18	328026	370163	School, Connah's Quay High School, Golftyn Lane, Connah's Quay, CH5 4BH	No	Yes	1,270
R19	327314	369848	Residential, Top-y-fron Hall, Kelsterton Lane, Connah's Quay, Northop Hall, CH6 5TF	Yes	Yes	1,460
R20	326567	369690	Residential, Oakenholt Lane, Rockcliffe, Connah's Quay, Northop Hall, CH6 5SU	Yes	Yes	1,840
R21	328609	369883	School, Golftyn Primary School, York Rd, Connah's Quay, CH5 4XA	No	Yes	1,830
R22	328824	370107	Residential, Church Street, Golftyn, Connah's Quay, CH5 4AQ	Yes	Yes	1,820
R23	328830	370114	Place of worship and residential, Church Street, Golftyn, Connah's Quay, CH5 4AQ	Yes	Yes	1,820

Receptor ID	X (m)	Y (m)	Description	Sensitive to Road Traffic Emissions?	Sensitive to Operational Stack Emissions?	Minimum Distance from the Proposed Development's Stacks (m)
R24	329067	369895	Place of worship, St Mark's Parish Church, Church Hill, Golftyn, CH5 4AD	No	Yes	2,140
R25	328941	369539	School, Bryn Deva C.P. School, Linden Avenue, Golftyn, CH5 4SN	No	Yes	2,300
R26	328634	369331	Residential, Lon Dderwen, Connah's Quay, CH5 4WG	Yes	Yes	2,300
R27	325516	372175	Residential, St David's, Croes Attilla, CH6 5SP	Yes	Yes	1,950
R28	324919	372091	School, St Richard Gwyn Roman Catholic High School, Albert Avenue, Flint, CH6 5JZ	Yes	Yes	2,480
R29	324990	372645	School, Ysgol Gymraeg Croes Atti, Chester Road, Flint, CH6 5DU	Yes	Yes	2,620
R30	324385	371941	School, Ysgol Maes Hyfryd, Maes Hyfryd, Flint, CH6 5LN	No	Yes	2,970
R31	324516	372532	School, Gwynedd County Primary School, Ysgol Pen Coch, Maes-y-Dre Avenue, Flint, CH6 5JT	No	Yes	3,010
R32	324546	373323	Residential, Lloyd Street, Flint, CH6 5PD	No	Yes	3,350
R33	324186	370145	Place of worship, St Thomas's Church, St Thomas's Court, Flint, Flint Mountain, CH6 5SL	No	Yes	3,370
R34	329678	369534	Residential, High Street, Golftyn, Connah's Quay, CH5 4DJ	Yes	Yes	2,840

Receptor ID	X (m)	Y (m)	Description	Sensitive to Road Traffic Emissions?	Sensitive to Operational Stack Emissions?	Minimum Distance from the Proposed Development's Stacks (m)
R35	329955	369652	Sports grounds, Dock Road, Connah's Quay, CH5 4EF	Yes	Yes	2,990
R36	329953	369351	Place of worship, High Street, Golftyn, Connah's Quay, CH5 4DJ	Yes	Yes	3,170
R37	329600	369081	Residential, Mold Road, Connah's Quay, CH5 4QN	Yes	Yes	3,090
R38	329128	368936	Residential, Cranbrook Close, Connah's Quay, CH5 4JY	No	Yes	2,900
R39	328165	368716	Residential, Mold Road, Connah's Quay, CH5 4QN	Yes	Yes	2,680
R40	330375	368913	Place of worship, Christ Church Deeside, Victoria Road, Shotton, CH5 1ES	No	Yes	3,770
R41	330528	367801	Hospital, Desside Community Hospital, Plough Lane, Aston, CH5 1XS	No	Yes	4,660
R42	332295	369161	Residential, Farm Road, Garden City, CH5 2HJ	No	Yes	5,270
R43	331087	366723	Residential, Overlea Drive, Deeside CH5 3HS	Yes	Yes	5,840
R44	331149	373884	Residential, Greenwood Farm, Unnamed Road, Neston CH64 5SH	No	Yes	4,410

* given the locations of receptors were identified in advance of the establishment of the travelers' encampment, other receptors' locations in its vicinity (e.g. R1, R2 and R4) are considered to be representative of the significance of effects predicted for the travelers' encampment.

Table 8-11: Sensitive Operational Ecological Receptors

Receptor ID	Ecological Site	Designation	OS Grid Coordinate*		Distance from the Proposed Development's Stacks (m)
			X	Y	
OE01	Heswall Dales	SSSI	326127	381815	10,400
OE02	Dee Estuary	Ramsar, SAC, SPA and SSSI	330798	372117	Varied
OE03	The Dungeon	SSSI	325074	383034	11,770
OE04	Thurstaston Common	SSSI	324893	384379	13,130
OE05	Dibbinsdale	SSSI	332304	380953	10,690
OE06	Mersey Estuary	Ramsar, SPA, SSSI	337932	379707	13,340
OE07	New Ferry	SSSI	335477	384176	15,070
OE08	Hallwood Farm Marl Pit	SSSI	334355	375893	8,190
OE09	Inner Marsh Farm	SSSI	330718	372980	3,580
OE10	River Dee and Bala Lake	SAC, SSSI	328755	371000	1,300
OE11	Connah's Quay Ponds and Woodland	SSSI	328955	368680	3,020
OE12	Maes y Grug	SSSI	326031	366762	4,760
OE13	Deeside and Buckley Newt sites	SAC, SSSI	329081	365705	5,830
OE14	Coed Talon Marsh	SSSI	327012	358683	12,630
OE15	Bryn Alyn	SSSI	320410	359418	13,820

Receptor ID	Ecological Site	Designation	OS Grid Coordinate*		Distance from the Proposed Development's Stacks (m)
			X	Y	
OE16	Cambrian Quarry	SSSI	321432	362367	10,780
OE17	Alyn Valley Woods and Alyn Gorge Caves	SAC, SSSI	319797	366391	9,040
OE18	Halkyn Mountain	SAC, SSSI	318259	376351	10,310
OE19	Pen-y-Cefn Pasture	SSSI	318909	366514	9,730
OE20	Cefn Meadow	SSSI	318929	366042	9,950
OE21	Coed Trefraith	SSSI	313639	372797	13,740
OE22	Ddol Uchaf	SSSI	314317	371354	12,990
OE23	Caerwys Tufa	SSSI	313035	371844	14,280
OE24	Tyddyn-y-barcut	SSSI	319073	367525	9,110
OE25	Parc Bodlondeb and Gwenallt-parc	SSSI	317876	370857	9,450
OE26	Parc Linden, Lixwm	SSSI	318383	371925	8,940
OE27	Flint Mountain	SSSI	324875	371560	2,440
OE28	Herward Smithy	SSSI	319855	373980	7,880
OE29	Shotton Lagoons and Reedbeds	SSSI	329515	371040	2,030
OE30	Local Ancient Woodlands	Ancient Woodlands (LWS)	329795	368480	3,670

Receptor ID	Ecological Site	Designation	OS Grid Coordinate*		Distance from the Proposed Development's Stacks (m)
			X	Y	
OE31	SSSI	Dee Cliff			

*Point of maximum long-term impact within each site

4.8.1 OE31 is designated for its geological features only and not sensitive to air quality impacts and therefore not considered further in this assessment.

Table 8-12: Sensitive Traffic Ecological Receptors

Receptor ID	Closest Coordinate to the Road		Site	Distance from the Proposed Development's Stacks (m)
	X	Y		
TE1	326253	371464	Ancient Woodland	1,060
TE2	325214	370709	Ancient Woodland	2,210
TE3	327514	369145	Ancient Woodland	2,160
TE4	327121	369346	Ancient Woodland	1,660
TE5	327330	370021	Ancient Woodland	1,290
TE6	327335	370021	Ancient Woodland	1,230
TE7a	328086	368701	Connah's Quay Ponds and Woodland	2,670
TE7b	328423	368613	Connah's Quay Ponds and Woodland	2,860
TE7c	328894	368709	Connah's Quay Ponds and Woodland	2,970
TE8a	326300	371751	Dee Estuary	1,060
TE8b	328631	370781	Dee Estuary	1,260
TE8c	329123	370046	Dee Estuary	2,090

Existing Baseline

4.9.1 Existing air quality conditions in the vicinity of the Proposed Development have been evaluated through modelling of existing traffic and stack emissions as well as a review of Local Authority air quality management reports, Defra published data, a site-specific survey and other sources. The key pollutants of concern resulting from construction and operation of the

Proposed Development and that have potentially elevated background concentrations from other sources are NOx, NO_2, CO, NH_3, PM_{10} and $PM_{2.5}$, therefore the assessment of baseline conditions within this chapter considers these pollutants only.

4.10.1 Baseline concentrations of the other pollutants such as amines, nitrosamines and nitramines are assumed to be negligible as there are no sources of these pollutants within the study area. There are also no UK background data available from published sources for these pollutants.

4.11.1 As stated in the North Wales Authorities Collaborative Project 2024 Air Quality Progress Report (Ref 8-44), there are no Air Quality Management Areas (AQMAs) designated within the administrative boundary of FCC or the adjoining Welsh local authority areas of Denbighshire and Wrexham, as well as in the Wirral, which also falls within the study area. The nearest AQMAs are located within Cheshire West and Chester Council, one in Chester approximately 12 km east from the Main Development Area and two in Ellesmere Port, approximately 13 km and 15 km north-east from the Main Development Area. The biggest of the three, Thornton le Moors in Ellesmere Port, is designated in relation to the 15-minute sulphur dioxide air quality standard and is not considered relevant to the assessment of impacts from the Proposed Development as emissions of SO_2 have been screened out. Whitby Rd/Station Rd AQMA is located approximately 350 m south-west of Ellesmere Port (Manchester Ship Canal) and Chester City Centre AQMA covers the entire area within the inner ring road and the adjoining sections of Liverpool Road, Parkgate Road, Hoole Way, Boughton gyratory and Watergate Street. They are both designated for nitrogen dioxide, with the main source cited as road traffic in both cases.

4.12.1 FCC conducts local air quality measurements for NO_2 at 59 sites (in 2023, according to the North Wales Authorities Collaborative Project 2024 Air Quality Progress Report (Ref 8-44)). At all locations where air quality measurement is conducted, all concentrations are well below the relevant objectives. Annual mean NO_2 concentrations at the closest urban background diffusion tube to the Main Development Area vary between 14.8 $\mu g/m^3$ and 10.5 $\mu g/m^3$ in the past five years (excluding 2020, as monitoring during that year was affected by the Covid-19 pandemic). Measurement concentrations at sites within the study area are presented in **Appendix 8-A: Air Quality Baseline Information** (**EN010166/APP/6.4**).

4.13.1 Defra's background maps (Ref 8-45) predict annual mean concentrations of 6.5 $\mu g/m^3$ for NO_2, 9.7 $\mu g/m^3$ for PM_{10} and 5.6 $\mu g/m^3$ for $PM_{2.5}$ in 2023 at the Main Development Area. APIS's background maps (Ref 8-42) predict concentrations of pollutant relevant to ecological sites. Relevant background predictions for all receptors are included in **Appendix 8-A: Air Quality Baseline Information** (**EN010166/APP/6.4**).

4.14.1 Results from the Project Specific Survey of NO_2 are presented in the next section.

4.15.1 Although information on NO_2 background concentrations is available from different sources (Defra Background Maps, Project Specific Survey and Local Authority Monitoring), the data from the Project Specific Survey has

been used for the sensitive human health receptors as there is good agreement with the Defra Background Map, and it is actual measurements as opposed to modelled data. The highest measurement out of the background sites has been used at all receptors as a conservative assumption. The Local Authority Data helps to provide an understanding of local concentrations over the past few years but is not available for 2024 yet so has not been used further.

4.16.1 In relation to ecosystems, for NOx and NH_3 background concentrations for designated sites have been sourced from the UK APIS website (Ref 8-42). Note that the existing Connah's Quay Power Station is already operational and therefore is included in the background concentrations used for the assessment. However, in the first stage of the assessment, the existing Connah's Quay Power Station's contributions have not been deducted from the background contribution. There is likely to be some degree of double counting of these emissions in the future scenario impacts but the over-estimate is unlikely to materially change the conclusion of the assessment.

Surveys

4.17.1 In addition to carrying out a desk-based study of baseline air quality, a three-month project-specific diffusion tube measurement survey has been carried out for baseline NO_2 to establish existing concentrations within the study area including adjacent to the road network surrounding the Main Development Area. Indicative locations are presented in **Figure 8-1: Construction Phase Assessment – Air Quality Study Area and Baseline Monitoring Locations** (**EN010166/APP/6.3**).

4.18.1 The annualised results, to correct for seasonal variation and to make data representative of the whole year, are detailed in **Appendix 8-A: Air Quality Baseline Information** (**EN010166/APP/6.4**), and summarised below in **Table 8-13**.

Table 8-13: Bias Adjusted and Annualised NO_2 Diffusion Tube Survey Monitoring Results

ID	Period 1 Raw Concentration (µg/m^3)	Period 2 Raw Concentration (µg/m^3)	Period 3 Raw Concentration (µg/m^3)	Raw Period Mean Concentration (µg/m^3)	Annualised Mean Concentration (µg/m^3)	Annualised and Bias Adjusted Concentration (µg/m^3)
DT1	31.83	33.89	28.69	31.5	32.9	26.6
DT2	26.66	22.31	19.05	22.7	23.7	19.2
DT3	19.42	12.97	13.03	15.1	15.8	12.8
DT4	17.09	13.58	9.29	13.3	13.9	11.3
DT5	18.01	11.55	7.94	12.5	13.1	10.6
DT6	22.97	17.82	14.22	18.3	19.2	15.5
DT7	9.47	6.10	5.08	6.9	7.2	5.8
DT8	9.75	6.47	6.70	7.6	8.0	6.5
DT9	10.53	6.41	4.97	7.3	7.6	6.2
DT10	21.51	14.57	16.61	17.6	18.3	14.9

Future Baseline

4.19.1 The future baseline scenarios are set out in **Chapter 2: Assessment Methodology** (**EN010166/APP/6.2.2**).

4.20.1 In order to represent a conservative approach, it has been assumed that baseline concentrations, particularly of NO_2 and NOx, would not decrease in future years. Therefore, the current baseline concentrations have been assumed to apply to the future baseline scenarios.

4.21.1 A staged approach has been used to assess the impacts from the Proposed Development. At first, impacts from the Proposed Development alone, alongside the current background contribution to total concentrations have been considered. If the impacts at ecology sites cannot be screened out as insignificant (based on being more than 1% and 10% of the AQAL for the relevant pollutant for annual and short-term impacts respectively), a second stage assesses the impact of the change between the operation of the Proposed Development and the end of operations of the existing Connah's Quay Power Station (i.e. contributions from the Proposed Development minus contributions from the existing Connah's Quay Power Station).

8.5 Development Design and Embedded Mitigation

5.1.1 The Proposed Development has been designed, as far as possible, to avoid or minimise impacts and effects on air quality.

5.2.1 The following embedded mitigation measures have been incorporated into the Proposed Development design:

- IED/ BAT-AEL Emission Limit Value (ELV) compliance: the Proposed Development would be designed such that process emissions to air comply with the ELV requirements specified in the IED and where additional, or tighter, the relevant BREFs. This would be regulated by NRW through the Environmental Permit required for the operation of the Proposed Development. The Environmental Permit may also include additional ELV for species not covered under the IED or LCP BREF;
- Stack Height(s): the proposed heights of the CCPs' absorber stacks and HRSGs for the Proposed Development have been set with consideration given to minimisation of ground-level air quality impacts and the visual impacts of taller stacks, based on the largest possible building massing for the primary structures of the Proposed Development. At the detailed design stage, should the final building dimensions be reduced from those assessed in this ES, it may be possible to use lower stack heights to reduce visual impacts without increasing the air quality impacts as presented in this chapter; and
- Emissions Control: the impact assessment is based on emissions performance from the CCPs that the FEED contractors have confirmed is achievable through the use of appropriate process control techniques. Emissions of amines would be controlled via the Environmental Permit in accordance with regulatory guidance on minimising the environmental impacts of post-combustion carbon dioxide capture (Ref 8-31). This is

anticipated to include the use of water wash stages and demisters prior to the flue gas exiting the CCPs' absorber stacks enabling the solvent that is carried over in the flue gas to be captured and returned to the process for re-use. Emissions of NOx from the HRSG are expected to be controlled through the use of SCR so as to minimise NOx carry over into the CCP.

5.3.1 The standard construction practices listed below are some of the relevant ones to this assessment, with the full list included in **Appendix 8-B: Air Quality Construction Dust Risk Assessment** (**EN010166/APP/6.4**), and included in the **Framework CEMP** (**EN010166/APP/6.5**):

- avoid mechanical roughening or grinding of concrete surfaces, where appropriate;
- store sand and aggregates in bunded areas and store cement powder and fine materials in silos, where appropriate;
- use water suppression and regular cleaning to minimise mud on roads, and control dust during earth moving activities;
- cover vehicles leaving the construction site that are carrying waste materials or spoil;
- employ wheel wash systems at site exits;
- restrict, where practicable, the use of unmade road accesses;
- minimise duration of storage of topsoil or spoil during pipeline construction;
- prohibit open fires on site;
- good practice would also be employed for the siting and operation of NRMM to control associated emissions, including:
  - minimise vehicle and plant idling;
  - where reasonably practicable, locating static plant away from sensitive boundaries or receptors; and
  - minimise operating time outside of core working hours/ daylight hours.

5.4.1 It is considered that the standard construction practices listed above would also be relevant to the decommissioning of the Proposed Development. The final measures to be included in the Decommissioning Environmental Management Plan would follow guidance available at the time of decommissioning.

8.6 Assessment of Likely Impacts and Effects

6.1.1 Taking into account the embedded mitigation measures as detailed in Section 8.5 above, the potential impacts and effects of the Proposed Development have been assessed using the methodology as detailed in Section 8.3 of this chapter and **Chapter 2: Assessment Methodology** (**EN010166/APP/6.2.2**).

Construction Phase

6.2.1 Impacts on air quality features during construction of the Proposed Development are likely to include:

- impacts on amenity, human health and ecological receptors from fugitive emissions of dust and particulate matter during the construction phase, are described **in Appendix 8-B: Air Quality Construction Dust Risk Assessment** (**EN010166/APP/6.4**); and
- impacts on human health and ecological receptors from traffic emissions during the construction phase are described in **Appendix 8-C: Air Quality Traffic Emissions Assessment** (**EN010166/APP/6.4**).

Construction Dust

6.3.1 Due to the overall scale of the Proposed Development Main Development Area and C&IEA, a large magnitude for all activities is a reasonable classification.

6.4.1 The Connection Corridors locations are considered to be a medium emissions source for fugitive dust emissions from earthworks and construction, and a small emission source for track-out and demolition related activities.

6.5.1 The sensitivity of the area to dust soiling effects at nearby sensitive receptors is classified as high for the Main Development Area and Connection Corridors for effects on people and property, based on the sensitivity of receptors within the study area and their distance from dust sources. The sensitivity of the area to human health impacts is low for the Main Development Area and Connection Corridors based on the existing baseline PM_{10} level.

6.6.1 There are high sensitivity ecological sites within the study area, namely the Dee Estuary ecological site, some adjacent to and within the Order limits.

6.7.1 The risk of impacts from uncontrolled dust generating activities has been determined through combination of the potential dust emission magnitude and the sensitivity of the area, for each activity to determine the package of good practice dust control measures that should be incorporated into the **Framework CEMP (EN010166/APP/6.5)** prior to any consideration of likely effects or the need for site specific mitigation measures. The risk of impacts from unmitigated activities range from negligible to high, therefore the relevant recommended measures from the IAQM high risk category (as listed in Section 8.2 of the IAQM guidance (Ref 8-40) would be an appropriate package of good practice control measures to be adopted for the proposed construction and decommissioning phases of the Proposed Development.

6.8.1 The assessment demonstrates that, with good practice dust control measures embedded through the **Framework CEMP** (**EN010166/APP/6.5**), the generation of fugitive dust emissions from potentially dust generating activities (demolition, earthworks, trackout and construction) would be sufficiently controlled through decision making that minimises the potential for emissions to occur near to sensitive receptors, by:

- minimising the magnitude and frequency of emissions at source;
- providing clear responsibilities to proactively consider the performance of routine control measures; and
- responding promptly when additional short-term measures are also required.

6.9.1 This leads to the overall conclusion that the frequency and duration of dust impacts would give rise to a **negligible** (**not significant**) effect on health or amenity at all amenity and human health receptor locations, including the travelers' encampment.

6.10.1 The same control measures would also result in **negligible** (**not significant**) effects at any sensitive features within designated ecological sites.

6.11.1 Overall, the likely effect of dust impacts from the construction phase is considered to be **not significant**.

Construction Traffic

6.12.1 The impact of the construction traffic emissions of NO_X and particulate matter on properties facing onto Kelsterton Road, including the travelers' encampment, (representative receptor R1), has been assessed as having an impact of low **adverse** magnitude which would result in a **negligible** (**not significant**) effect. All other human health receptors would experience impacts that are imperceptible in magnitude, resulting in a **negligible** effect overall, which is considered to be **not significant**.

6.13.1 The impact of the construction traffic emissions on atmospheric levels of NOx are at 1% or less than the relevant AQAL, which means impacts can be screened out as insignificant without further assessment at all receptors.

~~6.14.1~~ The impact of the construction traffic emissions on atmospheric levels of NH_3 and deposition rates of nitrogen and acid exceed 1% of the relevant AQAL at some receptors, although they are all below 100% of the AQAL. For NH_3 and nitrogen deposition, ~~As~~ the receptors where predicted impacts are predicted to be above 1% of the AQAL but below 100% are Non-statutory designated sites except TE8, hence impacts can be screened out as well. Impacts from NH_3 and nitrogen deposition at nationally designated sites which cannot be screened out and have been assessed in **Chapter 11: Terrestrial and Aquatic Ecology** (**EN010166/APP/6.2.11**). For acid deposition, the receptors where predicted impacts are predicted to be above 1% of the AQAL but below 100% are Non-statutory designated sites, which means impacts can be screened out as insignificant without further assessment at all receptors.

6.14.1

Operation Phase

6.15.1 Impacts on Air Quality features during the operation of the Proposed Development are likely to include:

- impacts on human health and ecological receptors from operations of the CCP and associated emissions, are described in **Appendix 8-D: Air Quality Operational Assessment** (**EN010166/APP/6.4**); and
- impacts on human health and ecological receptors from traffic emissions during the operational phase, are described in **Appendix 8-C: Air Quality Traffic Emissions Assessment** (**EN010166/APP/6.4**).

6.16.1 Impacts from stacks and traffic sources combined have been assessed below for each of the four operational scenarios.

Human Health

6.17.1 The impact of operational source emissions from the Proposed Development at human health receptors has been determined from model outputs at discrete receptor locations, as well as at the maximum anywhere in the study area. Concentration isopleths for impacts from the stacks are presented in the following figures in **EN010166/APP/6.3**:

- **Figure 8-6: FEED 1 Abated Scenario, Annual Mean NO_2 Process Contribution (µg/m³), 2021 Meteorological Data**
- **Figure 8-7: FEED 1 Abated Scenario, 1-hour Mean NO_2 Process Contribution (µg/m³), 99.79th Percentile of Hourly Averages, 2020 Meteorological Data**
- **Figure 8-8: FEED 1 Abated Scenario, Maximum 8-hour Mean CO Process Contribution (µg/m³), 100th Percentile of Hourly Averages, 2019 Meteorological Data**
- **Figure 8-9: FEED 1 Abated Scenario, Maximum 1-hour Mean Amines Process Contribution (µg/m³), 100th Percentile of Hourly Averages, 2020 Meteorological Data**
- **Figure 8-10: FEED 1 Abated Scenario, Maximum 24-hour Mean Amines Process Contribution (µg/m³), 100th Percentile of Hourly Averages, 2021 Meteorological Data**
- **Figure 8-11: FEED 1 Abated Scenario, Annual Mean Total N-amines Process Contribution (ng/m³), 2021 Meteorological Data**
- **Figure 8-12: FEED 1 Abated Scenario, Annual Mean NOx Process Contribution (% of the CL), 2021 Meteorological Data**
- **Figure 8-13: FEED 1 Abated Scenario, Annual Mean Ammonia Process Contribution (% of the CL), 2021 Meteorological Data**
- **Figure 8-14: FEED 1 Abated Scenario, Nitrogen Deposition Process Contribution (Grassland) (% of the CL), 2021 Meteorological Data**
- **Figure 8-15: FEED 2 Abated Scenario, Annual Mean NO_2 Process Contribution (µg/m³), 2020 Meteorological Data**
- **Figure 8-16: FEED 2 Abated Scenario, 1-hour Mean NO_2 Process Contribution (µg/m³), 99.79th Percentile of Hourly Averages, 2022 Meteorological Data**

- **Figure 8-17: FEED 2 Abated Scenario, Maximum 8-hour Mean CO Process Contribution (µg/m³), 100th Percentile of Hourly Averages, 2020 Meteorological Data**
- **Figure 8-18: FEED 2 Abated Scenario, Maximum 1-hour Mean Amines Process Contribution (µg/m³), 100th Percentile of Hourly Averages, 2022 Meteorological Data**
- **Figure 8-19: FEED 2 Abated Scenario, Maximum 24-hour Mean Amines Process Contribution (µg/m³), 100th Percentile of Hourly Averages, 2020 Meteorological Data**
- **Figure 8-20: FEED 2 Abated Scenario, Annual Mean Total N-amines Process Contribution (ng/m³), 2020 Meteorological Data**
- **Figure 8-21: FEED 2 Abated Scenario, Annual Mean NOx Process Contribution (% of the CL), 2020 Meteorological Data**
- **Figure 8-22: FEED 2 Abated Scenario, Annual Mean Ammonia Process Contribution (% of the CL), 2021 Meteorological Data**
- **Figure 8-23: FEED 2 Abated Scenario, Nitrogen Deposition Process Contribution (Grassland) (% of the CL), 2020 Meteorological Data**
- **Figure 8-24: FEED 1 Unabated Scenario, Annual Mean NO_2 Process Contribution (µg/m³), 2021 Meteorological Data**
- **Figure 8-25: FEED 1 Unabated Scenario, 1-hour Mean NO_2 Process Contribution (µg/m³), 99.79th Percentile of Hourly Averages, 2021 Meteorological Data**
- **Figure 8-26: FEED 1 Unabated Scenario, Maximum 8-hour Mean CO Process Contribution (µg/m³), 100th Percentile of Hourly Averages, 2021 Meteorological Data**
- **Figure 8-27: FEED 1 Unabated Scenario, Annual Mean NOx Process Contribution (% of the CL), 2021 Meteorological Data**
- **Figure 8-28: FEED 1 Unabated Scenario, Nitrogen Deposition Process Contribution (Grassland) (% of the CL), 2021 Meteorological Data**
- **Figure 8-29: FEED 2 Unabated Scenario, Annual Mean NO_2 Process Contribution (µg/m³), 2021 Meteorological Data**
- **Figure 8-30: FEED 2 Unabated Scenario, 1-hour Mean NO_2 Process Contribution (µg/m³), 99.79th Percentile of Hourly Averages, 2023 Meteorological Data**
- **Figure 8-31: FEED 2 Unabated Scenario, Maximum 8-hour Mean CO Process Contribution (µg/m³), 100th Percentile of Hourly Averages, 2021 Meteorological Data**
- **Figure 8-32: FEED 2 Unabated Scenario, Annual Mean NOx Process Contribution (% of the CL), 2021 Meteorological Data**

6.18.1 **Figure 8-33: FEED 2 Unabated Scenario, Nitrogen Deposition Process Contribution (Grassland) (% of the CL), 2021 Meteorological Data**The maximum hourly, daily and annual mean predicted concentrations at human

health receptors have been compared with the relevant AQALs, as summarised in **Table 8-14 to Table 8-17**. Any inconsistencies between the PEC (i.e. change in the PC and existing background concentration) and the predicted changes combined with the background concentrations are due to rounding only.

6.19.1 The predicted concentrations at all selected receptors within the study area have been reported in **Appendix 8-D: Air Quality Operational Assessment** (**EN010166/APP/6.4**).

6.20.1 For both the operation of two CCGT Trains with Single Absorbers for Carbon Capture FEED 1 and FEED 2 scenarios, the impact of operational emissions to air on human health, at selected receptors, including the travelers' encampment, or at the most affected location anywhere within the model domain, has been assessed as having a magnitude of **imperceptible to low adverse**, which results in an overall **negligible** or **minor adverse** effect, which is considered to be **not significant**.

6.21.1 Predicted concentrations at all human health receptors for N-Amines, for both Abated FEED 1 and Abated FEED 2 scenarios, are less than 50% of the NDMA EAL and therefore the change magnitude can be described as **imperceptible or very low** based on the descriptors in Table 8-9, which results in **negligible** effects. At the grid maximum, predicted environmental concentrations are less than 60% and 50% of NDMA EAL for Abated FEED 1 and Abated FEED 2 respectively. This change can be described as **low** in magnitude in the case of Abated FEED 1 and **very low** in magnitude in the case of Abated FEED 2, and negligible in terms of effect.

6.22.1 The assessment for N-Amines should be regarded as conservative as it incorporates a number of worst-case assumptions, namely:

- the Proposed Development is assumed to run two trains at full load during every hour of the year, whereas in practice the load factor is likely to be substantially lower due the plant providing dispatchable power when required;
- the assessment is based on the highest annual impact at each receptor out of the five years modelled;
- the assessment assumes no depletion of plume concentrations due to wet or dry deposition;
- the assessment assumes that all nitramines and nitrosamines emitted from the stack(s) or formed in the atmosphere have the same toxicity as NDMA, known to be one of the most toxic nitrosamine species. In particular current studies suggest that nitramines are substantially less toxic than their corresponding nitrosamines; and
- all buildings have been modelled at their maximum anticipated dimensions ensuring the potential for impacting on plume dispersion is captured in the dispersion model.

6.23.1 Based on the above, N-Amines impacts would be substantially lower than those presented.

6.24.1 For the Unabated FEED 1 scenario, the impact of operational emissions to air on human health, at selected receptors (including the travelers' encampment), or at the most affected location anywhere within the model domain, has been assessed as having a magnitude of imperceptible to very low adverse for all assessed pollutants, which results in an overall **negligible** effect, which is considered to be **not significant**.

6.25.1 For the Unabated FEED 2 scenario, the impact of operational emissions to air on human health, at selected receptors (including the travelers' encampment), or at the most affected location anywhere within the model domain, has been assessed as having a magnitude of imperceptible to very low adverse for all assessed pollutants, which results in an overall **negligible** effect, which is considered to be **not significant**.

6.26.1 Overall, the effect from the operation of the Proposed Development on human health is considered to be **not significant**.

Table 8-14: Abated FEED 1 Scenario - Results of Operational Impact Assessment for Human Health Impacts

Species	Location	AQAL (µg/m³ or mg/m³ for CO and ng/m³ for N-amines)	Proposed Development PC (µg/m³ or mg/m³ for CO and ng/m³ for N-amines)	Road Traffic Emissions PC (µg/m³)	PC/AQAL (%)	Magnitude of Impact	Background (µg/m³ or mg/m³ for CO and ng/m³ for N-amines)	PC from Cumulative Sources (µg/m³)	Future Year with Proposed Development (PEC) (µg/m³ or mg/m³ for CO and ng/m³ for N-amines)	PEC/AQAL (%)
Maximum NO_2 hourly mean (as the 99.79th percentile)	Most affected sensitive receptor (R10)	200	14.7	<0.1	7.3%	Imperceptible	13.0	0.3	28.0	14.0%
	Maximum anywhere within the model domain		16.5	<0.1	8.2%	Imperceptible	13.0	<0.1	29.5	14.7%
Maximum NO_2 annual mean	Most affected sensitive receptor (R16/R25)	40	0.1	<0.1	0.3%	Imperceptible	6.5	0.1	6.7	16.7%
	Maximum anywhere within the model domain		0.1	<0.1	0.3%	Imperceptible	6.5	0.1	7.3	18.1%
Maximum CO 8-hour	Most affected sensitive receptor (R16)	10	0.07	NA	0.7%	Imperceptible	0.53	NA	0.60	6.0%

Species	Location	AQAL (µg/m³ or mg/m³ for CO and ng/m³ for N-amines)	Proposed Development PC (µg/m³ or mg/m³ for CO and ng/m³ for N-amines)	Road Traffic Emissions PC (µg/m³)	PC/AQAL (%)	Magnitude of Impact	Background (µg/m³ or mg/m³ for CO and ng/m³ for N-amines)	PC from Cumulative Sources (µg/m³)	Future Year with Proposed Development (PEC) (µg/m³ or mg/m³ for CO and ng/m³ for N-amines)	PEC/AQAL (%)
rolling average	Maximum anywhere within the model domain		0.07	NA	0.7%	Imperceptible	0.60	NA	0.68	6.8%
Maximum Total Amines long-term daily mean	Most affected sensitive receptor (R16/R21/R25)	100	0.01	NA	<0.1%	Imperceptible	No Data Available	<0.1	0.01	<0.1%
	Maximum anywhere within the model domain		0.03	NA	<0.1%	Imperceptible	No Data Available	<0.1	0.03	<0.1%
Maximum Total Amines hourly mean	Most affected sensitive receptor (R19/R20)	400	0.57	NA	0.1%	Imperceptible	No Data Available	<0.01	0.57	0.1%
	Maximum anywhere within the model domain		0.63	NA	0.2%	Imperceptible	No Data Available	<0.01	0.63	0.2%

Species	Location	AQAL (µg/m³ or mg/m³ for CO and ng/m³ for N-amines)	Proposed Development PC (µg/m³ or mg/m³ for CO and ng/m³ for N-amines)	Road Traffic Emissions PC (µg/m³)	PC/AQAL (%)	Magnitude of Impact	Background (µg/m³ or mg/m³ for CO and ng/m³ for N-amines)	PC from Cumulative Sources (µg/m³)	Future Year with Proposed Development (PEC) (µg/m³ or mg/m³ for CO and ng/m³ for N-amines)	PEC/AQAL (%)
Maximum Amine 2 daily mean (against Amine 2 derived AQAL)	Most affected sensitive receptor (Several)	15	<0.01	NA	<0.1%	Imperceptible	No Data Available	NA	<0.01	<0.1%
	Maximum anywhere within the model domain		<0.01	NA	<0.1%	Imperceptible	No Data Available	NA	<0.01	<0.1%
Maximum Total N-amines annual mean	Most affected sensitive receptor (R25)	0.2 (ng/m³)	0.10	NA	47.9%	Very Low	No Data Available	<0.01	0.10	50.1%
	Maximum anywhere within the model domain		0.11	NA	56.3%	Low	No Data Available	0.01	0.12	58.8%
Maximum Formaldehyde 30-min mean	Most affected sensitive receptor (R19/R20/R41/R44)	100	1.8	NA	1.8%	Imperceptible	<0.1	NA	1.8	1.8%

Species	Location	AQAL (µg/m³ or mg/m³ for CO and ng/m³ for N-amines)	Proposed Development PC (µg/m³ or mg/m³ for CO and ng/m³ for N-amines)	Road Traffic Emissions PC (µg/m³)	PC/AQAL (%)	Magnitude of Impact	Background (µg/m³ or mg/m³ for CO and ng/m³ for N-amines)	PC from Cumulative Sources (µg/m³)	Future Year with Proposed Development (PEC) (µg/m³ or mg/m³ for CO and ng/m³ for N-amines)	PEC/AQAL (%)
	Maximum anywhere within the model domain		2.1	NA	2.1%	Imperceptible	<0.1	NA	2.1	2.1%
Maximum Formaldehyde Annual mean	Most affected sensitive receptor (R21)	5	0.04	NA	0.9%	Very Low	No Data Available	NA	0.04	0.9%
	Maximum anywhere within the model domain		0.04	NA	0.9%	Very Low	No Data Available	NA	0.04	0.9%

Table 8-15: Abated FEED 2 Scenario - Results of Operational Impact Assessment for Human Health Impacts Scenario

Species	Location	AQAL (µg/m³ or mg/m³ for CO and ng/m³ for N-amines)	Proposed Development PC (µg/m³ or mg/m³ for CO and ng/m³ for N-amines)	Road Traffic Emissions PC (µg/m³)	PC/ AQAL (%)	Magnitude of Impact	Background (µg/m³ or mg/m³ for CO and ng/m³ for N-amines)	PC from Cumulative Sources (µg/m³)	Future Year with Proposed Development (PEC) (µg/m³ or mg/m³ for CO and ng/m³ for N-amines)	PEC/ AQAL (%)
Maximum NO_2 hourly mean (as the 99.79th percentile)	Most affected sensitive receptor (R10)	200	26.5	<0.1	13.3%	Low	13.0	0.4	39.9	20.0%
	Maximum anywhere within the model domain		39.8	<0.1	19.9%	Low	13.0	<0.1	52.8	26.4%
Maximum NO_2 annual mean	Most affected sensitive receptor (R38)	40	0.1	<0.1	0.3%	Imperceptible	7.5	0.1	7.7	19.2%
	Maximum anywhere within the model domain		0.2	<0.1	0.4%	Imperceptible	6.5	0.1	6.8	16.9%

Species	Location	AQAL (µg/m³ or mg/m³ for CO and ng/m³ for N-amines)	Proposed Development PC (µg/m³ or mg/m³ for CO and ng/m³ for N-amines)	Road Traffic Emissions PC (µg/m³)	PC/ AQAL (%)	Magnitude of Impact	Background (µg/m³ or mg/m³ for CO and ng/m³ for N-amines)	PC from Cumulative Sources (µg/m³)	Future Year with Proposed Development (PEC) (µg/m³ or mg/m³ for CO and ng/m³ for N-amines)	PEC/ AQAL (%)
Maximum CO 8-hour rolling average	Most affected sensitive receptor (R9)	10	0.15	NA	1.5%	Imperceptible	0.51	NA	0.66	6.6%
	Maximum anywhere within the model domain		0.22	NA	2.2%	Imperceptible	0.6	NA	0.82	8.2%
Maximum Total Amines long-term daily mean	Most affected sensitive receptor (Several)	100	<0.01	NA	<0.1%	Imperceptible	No Data Available	<0.01	<0.01	<0.1%
	Maximum anywhere within the model domain		<0.01	NA	<0.1%	Imperceptible	No Data Available	<0.01	<0.01	<0.1%
Maximum Total	Most affected sensitive	400	0.10	NA	<0.1%	Imperceptible	No Data Available	<0.01	0.10	<0.1%

Species	Location	AQAL (µg/m³ or mg/m³ for CO and ng/m³ for N-amines)	Proposed Development PC (µg/m³ or mg/m³ for CO and ng/m³ for N-amines)	Road Traffic Emissions PC (µg/m³)	PC/ AQAL (%)	Magnitude of Impact	Background (µg/m³ or mg/m³ for CO and ng/m³ for N-amines)	PC from Cumulative Sources (µg/m³)	Future Year with Proposed Development (PEC) (µg/m³ or mg/m³ for CO and ng/m³ for N-amines)	PEC/ AQAL (%)
Amines hourly mean	receptor (R8/R9)									
	Maximum anywhere within the model domain		0.13	NA	<0.1%	Imperceptible	No Data Available	<0.01	0.13	<0.1%
Maximum Amine 2 daily mean (against Amine 2 derived AQAL)	Most affected sensitive receptor (Several)	15	<0.01	NA	<0.1%	Imperceptible	No Data Available	NA	<0.1	<0.1%
	Maximum anywhere within the model domain		<0.01	NA	<0.1%	Imperceptible	No Data Available	NA	<0.1	<0.1%
Maximum Total N-	Most affected sensitive	0.2 (ng/m³)	0.08	NA	38.2%	Very Low	No Data Available	<0.01	0.08	40.4%

Species	Location	AQAL (µg/m³ or mg/m³ for CO and ng/m³ for N-amines)	Proposed Development PC (µg/m³ or mg/m³ for CO and ng/m³ for N-amines)	Road Traffic Emissions PC (µg/m³)	PC/ AQAL (%)	Magnitude of Impact	Background (µg/m³ or mg/m³ for CO and ng/m³ for N-amines)	PC from Cumulative Sources (µg/m³)	Future Year with Proposed Development (PEC) (µg/m³ or mg/m³ for CO and ng/m³ for N-amines)	PEC/ AQAL (%)
amines annual mean	receptor (R25)									
	Maximum anywhere within the model domain		0.09	NA	45.7%	Very Low	No Data Available	0.01	0.10	48.4%
Maximum Formaldehyde 30-min mean	Most affected sensitive receptor (R8/R9)	100	0.13	NA	0.1%	Imperceptible	No Data Available	NA	0.13	0.1%
	Maximum anywhere within the model domain		0.17	NA	0.2%	Imperceptible	No Data Available	NA	0.17	0.2%
Maximum Formaldeh	Most affected sensitive	5	<0.01	NA	<0.1%	Imperceptible	No Data Available	NA	<0.01	<0.1%

Species	Location	AQAL (µg/m³ or mg/m³ for CO and ng/m³ for N-amines)	Proposed Development PC (µg/m³ or mg/m³ for CO and ng/m³ for N-amines)	Road Traffic Emissions PC (µg/m³)	PC/ AQAL (%)	Magnitude of Impact	Background (µg/m³ or mg/m³ for CO and ng/m³ for N-amines)	PC from Cumulative Sources (µg/m³)	Future Year with Proposed Development (PEC) (µg/m³ or mg/m³ for CO and ng/m³ for N-amines)	PEC/ AQAL (%)
yde Annual mean	receptor (Several)									
	Maximum anywhere within the model domain		<0.01	NA	0.1%	Imperceptible	No Data Available	NA	<0.01	0.1%

Table 8-16: Unabated FEED 1 Scenario - Results of Operational Impact Assessment for Human Health Impacts

Species	Location	AQAL (µg/m³ or mg/m³ for CO)	Proposed Development PC (µg/m³ or mg/m³ for CO)	Road Traffic Emissions PC (µg/m³)	PC/ AQAL (%)	Magnitude of Impact	Background (µg/m³ or mg/m³ for CO)	PC from Cumulative Sources (µg/m³)	Future Year with Proposed Development (PEC) (µg/m³ or mg/m³ for CO)	PEC/ AQAL (%)
Maximum NO_2	Most affected sensitive receptor (R15)	200	14.9	<0.1	7.5%	Imperceptible	19.6	<0.1	34.6	17.3%

Species	Location	AQAL (µg/m³ or mg/m³ for CO)	Proposed Development PC (µg/m³ or mg/m³ for CO)	Road Traffic Emissions PC (µg/m³)	PC/ AQAL (%)	Magnitude of Impact	Background (µg/m³ or mg/m³ for CO)	PC from Cumulative Sources (µg/m³)	Future Year with Proposed Development (PEC) (µg/m³ or mg/m³ for CO)	PEC/ AQAL (%)
hourly mean (as the 99.79th percentile)	Maximum anywhere within the model domain		23.2	0.1	11.6%	Low	13.0	<0.1	36.3	18.1%
Maximum NO_2 annual mean	Most affected sensitive receptor (R15)	40	0.3	<0.1	0.8%	Very Low	9.7	0.1	10.1	25.3%
	Maximum anywhere within the model domain		0.3	<0.1	0.8%	Very Low	6.5	0.1	6.9	17.3%
Maximum CO 8-hour rolling average	Most affected sensitive receptor (R15/R16/R18)	10	0.10	NA	1.0%	Imperceptible	0.5	NA	0.63	6.0%
	Maximum anywhere		0.12	NA	1.2%	Imperceptible	0.6	NA	0.72	7.3%

Species	Location	AQAL (µg/m³ or mg/m³ for CO)	Proposed Development PC (µg/m³ or mg/m³ for CO)	Road Traffic Emissions PC (µg/m³)	PC/ AQAL (%)	Magnitude of Impact	Background (µg/m³ or mg/m³ for CO)	PC from Cumulative Sources (µg/m³)	Future Year with Proposed Development (PEC) (µg/m³ or mg/m³ for CO)	PEC/ AQAL (%)
	within the model domain									

Table 8-17: Unabated FEED 2 Scenario - Results of Operational Impact Assessment for Human Health Impacts

Species	Location	AQAL (µg/m³ or mg/m³ for CO)	Proposed Development PC (µg/m³ or mg/m³ for CO)	Road Traffic Emissions PC (µg/m³)	PC /AQAL (%)	Magnitude of Impact	Background (µg/m³ or mg/m³ for CO)	PC from Cumulative Sources (µg/m³)	Future Year with Proposed Development (PEC) (µg/m³ or mg/m³ for CO)	PEC/ AQAL (%)
Maximum NO_2 hourly mean (as the 99.79th percentile)	Most affected sensitive receptor (R16)	200	16.4	<0.1	8.2%	Imperceptible	13.9	<0.1	30.4	15.2%
	Maximum anywhere within the model domain		20.6	0.1	10.3%	Imperceptible	13.0	<0.1	33.6	16.8%

Species	Location	AQAL (µg/m³ or mg/m³ for CO)	Proposed Development PC (µg/m³ or mg/m³ for CO)	Road Traffic Emissions PC (µg/m³)	PC /AQAL (%)	Magnitude of Impact	Background (µg/m³ or mg/m³ for CO)	PC from Cumulative Sources (µg/m³)	Future Year with Proposed Development (PEC) (µg/m³ or mg/m³ for CO)	PEC/ AQAL (%)
Maximum NO_2 annual mean	Most affected sensitive receptor (R15)	40	0.3	<0.1	0.7%	Very Low	9.7	0.1	10.1	25.2%
	Maximum anywhere within the model domain		0.3	<0.1	0.7%	Very Low	6.5	0.1	6.9	17.2%
Maximum CO 8-hour rolling average	Most affected sensitive receptor (R15/R18)	10	0.08	NA	0.8%	Imperceptible	0.52	NA	0.60	6.0%
	Maximum anywhere within the model domain		0.12	NA	1.2%	Imperceptible	0.60	NA	0.73	7.3%

Ecology

6.27.1 Operational air quality results for the most affected ecological receptor are presented in **Table 8-18**, **Table 8-20, Table 8-22** and **Table 8-24** for impacts from the Proposed Development alone for the Abated FEED 1, Abated FEED 2, Unabated FEED 1 and Unabated FEED 2 scenario respectively, with the identity of the receptor indicated within parentheses in column 1. Concentration and deposition isopleths are presented in **Figures 8-12** to **8-14** (**EN010166/APP/6.3**) for the Abated FEED 1 scenario, **Figures 8-21 to 8-23** (**EN010166/APP/6.3**) for the Abated FEED 2 scenario, **Figures 8-27** to **8-28** (**EN010166/APP/6.3**) for the Unabated FEED 1 scenario, and **Figures 8-32** to **8-33** (**EN010166/APP/6.3**) for the Unabated FEED 2 scenario. Operational air quality results for the worst affected ecological receptor are presented in **Table 8-19**, **Table 8-21**, **Table 8-23** and **Table 8-25** for impacts from the change in contributions, i.e. the Proposed Development concentration minus the existing Connah's Quay Power Station, for the Abated FEED 1, Abated FEED 2, Unabated FEED 1 and Unabated FEED 2 scenario respectively. These results are only presented where effects from the Proposed Development alone cannot be screened out as not significant without the need for further assessment by an ecologist.

6.28.1 Any inconsistencies between the PEC (i.e. change in the PC and existing background concentration) and the predicted changes combined with the background concentrations are due to rounding only. Results at all other ecological receptors are presented in **Appendix 8-D: Air Quality Operational Assessment** (**EN010166/APP/6.4**).

Abated FEED 1 Scenario

6.29.1 For all receptors, the predicted annual average NO_X concentration PCs are less than 1% of the AQAL and therefore are considered insignificant without the need for further assessment by an ecologist. It is important to note that the background concentrations are likely to already include to some degree the contribution from the existing Connah's Quay Power Station, and therefore it is considered that the actual PECs would be below these values.

6.30.1 The daily mean NO_X concentrations show a PC for all receptors that is less than 10% of the AQAL or less than 20% of the AQAL minus the background concentration and therefore are considered insignificant without the need for further assessment by an ecologist.

6.31.1 For all receptors, except OE11, the predicted annual average ammonia concentrations are below 1% of the AQAL at nationally designated sites, and below 100% of the AQAL at Non-statutory designated sites, and therefore are considered insignificant. At OE11, the predicted annual average ammonia concentrations are 1.1% of the AQAL. The background values at all receptors are higher than the AQAL, therefore the PEC at OE11 is greater than the AQAL and cannot be screened out and required further assessment by an ecologist. The significance of this change is discussed in **Chapter 11: Terrestrial and Aquatic Ecology** (**EN010166/APP/6.2.11**).

6.32.1 The nitrogen deposition results show that the predicted impacts from the Proposed Development (FEED 1) are less than the 1% threshold to

demonstrate further assessment is not required for all ecological receptors except TE7c, TE8b, TE8c, OE02, OE11, OE29 and OE30 (further details on these are provided below).

6.33.1 OE30 is not a statutory designated site and nitrogen the deposition PCs there are more than an order of magnitude less than 100% of the AQAL and effects can therefore be screened out as insignificant without further assessment. At receptors TE7c, TE8b, TE8c, OE02, OE11, OE29, the background values are higher than the critical loads and the PECs are greater than 70%, therefore these cannot be screened out and require further assessment by an ecologist. The significance of the change at these six receptors is discussed in **Chapter 11: Terrestrial and Aquatic Ecology** (**EN010166/APP/6.2.11**).

6.34.1 For acid deposition, results show that the predicted impacts from the Proposed Development (FEED 1) are less than the 1% threshold to demonstrate insignificance without the need for further assessment for all ecological receptors.

Abated FEED 2 scenario

6.35.1 For all receptors, the predicted annual average NO_X concentration PC is less than 1% of the AQAL and therefore are considered insignificant without the need for further assessment by an ecologist. It is important to note that the background concentrations are likely to already include to some degree the contribution from the existing Connah's Quay Power Station, and therefore it is considered that the actual PECs would be below these values.

6.36.1 The daily mean NO_X concentrations show a PC for all receptors, except for OE02 and OE30 that is less than 10% of the AQAL or less than 20% of the AQAL minus the background concentration. OE30 is not a statutory designated site and the PC there is less than 100% of the AQAL and effects can therefore be screened out as insignificant without further assessment. At OE02, the total concentration is predicted to be 58.0%, of the AQAL, well below the objective. Moreover, the IAQM Guidance on assessing air quality impacts on designated nature conservation sites (Ref 8-39) proposes that a critical level of 200 $\mu g/m^3$ is appropriate, unless in locations where SO_2 and ozone are above their critical levels, which is not generally the current situation in the UK. Using this criteria, the predicted impacts are small enough that effects would be insignificant without requiring further assessment.

6.37.1 If the removal of the existing Connah's Quay Power Station is taken into account, the change in concentration at all receptors (including OE02) is less than 10% of the AQAL and effects can be screened out as insignificant without the need for further assessment.

6.38.1 For all receptors, the predicted annual average ammonia concentrations are up to 1% of the AQAL at nationally designated sites except at OE02, and below 100% of the AQAL at Non-statutory designated sites, and therefore are considered insignificant everywhere but at OE02. There, the predicted annual average ammonia concentrations are of 1.6% of the AQAL. The background values at all receptors are higher than the AQAL, therefore the

PEC at OE02 are greater than the AQAL and cannot be screened out and requires further assessment by an ecologist. The significance of this change is discussed in **Chapter 11: Terrestrial and Aquatic Ecology** (**EN010166/APP/6.2.11**).

6.39.1 The nitrogen deposition results show that the predicted impacts from the Proposed Development (FEED 2) are less than the 1% threshold to demonstrate further assessment is not required for all ecological receptors except TE7c, TE8b, TE8c, OE11, OE02, and OE30 (further details provided below).

6.40.1 OE30 is not a site with a statutory designation and predicted nitrogen deposition PC there is less than 100% of the AQAL and effects can be screened out from further assessment. At receptors TE7c, TE8b, TE8c, OE02, OE11, the background values are higher than the critical loads and the PECs are greater than 70%, therefore these cannot be screened out and require further assessment by an ecologist. The significance of the change at these eight receptors is discussed in **Chapter 11: Terrestrial and Aquatic Ecology** (**EN010166/APP/6.2.11**).

6.41.1 For acid deposition, the assessment has demonstrated that the predicted impacts from the Proposed Development (FEED 2) are less than the 1% threshold to demonstrate insignificance without the need for further assessment for all ecological receptors.

Unabated Feed 1 Scenario

6.42.1 For all ecological receptors, the predicted annual mean NOx concentration PC is less than 1% of the AQAL or the PEC is less than 70% of the AQAL and therefore the effects can be considered insignificant without further assessment by an ecologist. It is important to note that the background concentrations are likely to already include to some degree the contribution from the existing Connah's Quay Power Station, and therefore it is considered that the actual PECs would be below these reported concentration values.

6.43.1 The daily mean NOx concentrations PC for all receptors except OE02 and OE10 is less than 10% of the AQAL or less than 20% of the AQAL minus the background concentration. At OE02 and OE10, the total predicted concentrations are below the AQAL. Moreover, the IAQM Guidance on assessing air quality impacts on designated nature conservation sites (Ref 8-39) proposes that a critical level of 200 $\mu g/m^3$ is appropriate, unless in locations where SO_2 and ozone are above their critical levels, which is not generally the current situation in the UK. Using this criteria, the predicted impacts are small enough to be confident that the effects would be insignificant without further assessment.

6.44.1 The nitrogen deposition results show that the predicted impacts from the Proposed Development (Unabated FEED 1 Scenario) are less than the 1% or 100% thresholds (for Statutory and Non-statutory designated sites respectively) to demonstrate further assessment is not required for all ecological receptors except OE2, and TE8b.

6.45.1 At these receptors, the background values are higher than the critical loads and the PECs are greater than 70%, therefore these cannot be screened out and required further assessment by an ecologist. The significance of the effect resulting from the predicted change at these two receptors is discussed in **Chapter 11: Terrestrial and Aquatic Ecology** (**EN010166/APP/6.2.11**).

For acid deposition, the assessment has demonstrated that the predicted impacts from the Proposed Development (Unabated) are less than the 1% threshold to demonstrate insignificance without the need for further assessment for all ecological receptors.

Unabated FEED 2 Scenario

6.46.1 For all ecological receptors, the predicted annual mean NOx concentration PC is less than 1% of the AQAL or the PEC is less than 70% of the AQAL and therefore the effects can be considered insignificant without further assessment by an ecologist. It is important to note that the background concentrations are likely to already include to some degree the contribution from the existing Connah's Quay Power Station, and therefore it is considered that the actual PECs would be below these reported concentration values.

6.47.1 The daily mean NOx concentrations PC for all receptors except OE02, OE10 and OE29, is less than 10% of the AQAL or less than 20% of the AQAL minus the background concentration. At OE02, OE10 and OE29, the total predicted concentrations are below the AQAL. Moreover, the IAQM Guidance on assessing air quality impacts on designated nature conservation sites (Ref 8-39) proposes that a critical level of 200 $\mu g/m^3$ is appropriate, unless in locations where SO_2 and ozone are above their critical levels, which is not generally the current situation in the UK. Using this criteria, the predicted impacts are small enough that effects would be insignificant without requiring further assessment.

6.48.1 The nitrogen deposition results show that the predicted impacts from the Proposed Development are within the 1% or 100% thresholds (for Statutory and Non-statutory designated sites respectively) to demonstrate further assessment is not required for all ecological receptors.

6.49.1 At TE8b, the background values are higher than the critical loads and the PECs are greater than 70%, therefore these cannot be screened out and required further assessment by an ecologist. The significance of the effect resulting from the predicted change at TE8b is discussed in **Chapter 11: Terrestrial and Aquatic Ecology** (**EN010166/APP/6.2.11**).

6.50.1 For acid deposition, the assessment has demonstrated that the predicted impacts from the Proposed Development (Unabated) are less than the 1% threshold to demonstrate insignificance without the need for further assessment for all ecological receptors.

Table 8-18: Results of Operational Impact Assessment for Designated Habitats – Abated FEED 1 Scenario - Proposed Development only

Species	AQAL (µg/m³)	Units	Proposed development PC	Road Emissions PC (µg/m³)	PC/AQAL (%)	Background (µg/m³)	PC from Cumulative Sources (µg/m³)	Future Year with Proposed Development (PEC)	PEC/AQAL (%)
Most impacted location at any receptor for NOx daily mean (as the 100th percentile) (OE02)	75	µg/m³	8.3	<0.1	11.1%	25.5	<0.1	33.8	45.0%
Most impacted location at any receptor for NOx annual mean (OE30)	30	µg/m³	0.1	<0.1	0.4%	10.0	0.1	10.3	34.2%
Most impacted location at any receptor for NH_3 annual	1 or 3	µg/m³	0.01	<0.01	1.1%	1.9	NA	1.9	195.1%

Species	AQAL (µg/m³)	Units	Proposed development PC	Road Emissions PC (µg/m³)	PC/AQAL (%)	Background (µg/m³)	PC from Cumulative Sources (µg/m³)	Future Year with Proposed Development (PEC)	PEC/AQAL (%)
mean (OE30)									
Most impacted location at any receptor for Nitrogen Deposition (TE8c)	5, 6 or 10	Kg/ha/yr	0.12	0.01	2.6%	16.81	0.04	16.98	339.6%
Most impacted location at any receptor for Acid Deposition (TE7c)	Min CL min N 0.499 Min CL Max N 1.72 Min CL Max S 1.578	Keq/ha/yr	0.01	<0.01	0.5%	2.49	<0.01	2.50	144.8%

Table 8-19: Results of Operational Impact Assessment for Designated Habitats – Abated FEED 1 Scenario - Change from existing

Species	AQAL (µg/m³)	Units	Change	Change/AQAL (%)	Background (µg/m³)	Future Year with Proposed Development (PEC)	PEC/AQAL (%)
Most impacted location at any receptor for Nitrogen Deposition (TE8c)	5, 6 or 10	Kg/ha/yr	0.07	1.4%	16.81	16.92	338.5%

Table 8-20: Results of Operational Impact Assessment for Designated Habitats – Abated FEED 2 Scenario - Proposed Development only

Species	AQAL (µg/m³)	Units	Proposed development PC	Road Emissions PC (µg/m³)	PC/AQAL (%)	Background (µg/m³)	PC from Cumulative Sources (µg/m³)	Future Year with Proposed Development (PEC)	PEC/AQAL (%)
Most impacted location at any receptor for NOx daily mean (as the 100th percentile) (OE02)	75	µg/m³	18.0	<0.1	24.0%	25.5	<0.1	43.5	58.0%
Most impacted location at any receptor for NOx annual mean (OE02)	30	µg/m³	0.2	<0.1	0.8%	12.7	0.7	13.7	45.5%
Most impacted location at any receptor for NH_3 annual	1 or 3	µg/m³	0.02	<0.01	1.6%	1.9	NA	1.9	193.6%

Species	AQAL (µg/m³)	Units	Proposed development PC	Road Emissions PC (µg/m³)	PC/AQAL (%)	Background (µg/m³)	PC from Cumulative Sources (µg/m³)	Future Year with Proposed Development (PEC)	PEC/AQAL (%)
mean (OE02)									
Most impacted location at any receptor for Nitrogen Deposition (OE02)	5, 6 or 10	Kg/ha/yr	0.13	<0.01	2.6%	16.3	0.10	16.55	330.9%
Most impacted location at any receptor for Acid Deposition (TE7c)	Min CL min N 0.499 Min CL Max N 1.72 Min CL Max S 1.578	Keq/ha/yr	0.01	<0.01	0.6%	2.48	<0.01	2.49	144.8%

Table 8-21: Results of Operational Impact Assessment for Designated Habitats – FEED 2 Scenario - Change from existing

Species	AQAL (µg/m³)	Units	Change	Change/AQAL (%)	Background (µg/m³)	Future Year with Proposed Development (PEC)	PEC/AQAL (%)
Most impacted location at any receptor for NOx daily mean (as the 100th percentile) (OE02)	75	µg/m³	-11.49	-15.3%	25.5	14.0	18.6%
Most impacted location at any receptor for Nitrogen Deposition (OE02)	5, 6 or 10	Kg/ha/yr	0.11	2.3%	16.3	16.53	330.6%

Table 8-22: Results of Operational Impact Assessment for Designated Habitats – Unabated FEED 1 Scenario - Proposed Development only

Species	AQAL (µg/m³)	Units	Proposed development PC	Road Emissions PC (µg/m³)	PC/AQAL (%)	Background (µg/m³)	PC from Cumulative Sources (µg/m³)	Future Year with Proposed Development (PEC)	PEC/AQAL (%)
Most impacted location at any receptor for NOx daily mean (as the 100th percentile) (OE02)	75	µg/m³	17.3	<0.1	23.1%	25.5	5.8	48.6	64.7%
Most impacted location at any receptor for NOx annual mean (OE02)	30	µg/m³	0.4	<0.1	1.2%	12.7	0.8	13.9	46.4%
Most impacted location at any receptor for Nitrogen	5, 6 or 10	Kg/ha/yr	0.04	0.03	1.2%	16.19	0.02	16.27	325.5%

Species	AQAL (µg/m³)	Units	Proposed development PC	Road Emissions PC (µg/m³)	PC/AQAL (%)	Background (µg/m³)	PC from Cumulative Sources (µg/m³)	Future Year with Proposed Development (PEC)	PEC/AQAL (%)
Deposition (TE8b)									
Most impacted location at any receptor for Acid Deposition (TE7c)	Min CL min N 0.499 Min CL Max N 1.72 Min CL Max S 1.578	Keq/ha/yr	0.01	<0.01	0.3%	2.48	<0.01	2.49	144.5%

Table 8-23: Results of Operational Impact Assessment for Designated Habitats – Unabated FEED 1 Scenario - Change from existing

Species	AQAL (µg/m³)	Units	Change	Change/AQAL (%)	Background (µg/m³)	Future Year with Proposed Development (PEC)	PEC/AQAL (%)
Most impacted location at any receptor for NOx daily mean (as the 100th percentile) (OE02)	75	µg/m³	-6.5	-8.6%	25.5	24.8	33.1%

Species	AQAL (µg/m³)	Units	Change	Change/AQAL (%)	Background (µg/m³)	Future Year with Proposed Development (PEC)	PEC/AQAL (%)
Most impacted location at any receptor not screened out for Nitrogen Deposition (TE8b)	5, 6 or 10	Kg/ha/yr	0.06	1.2%	16.19	16.26	325.3%

Table 8-24: Results of Operational Impact Assessment for Designated Habitats – Unabated FEED 2 Scenario - Proposed Development only

Species	AQAL (µg/m³)	Units	Proposed development PC	Road Emissions PC (µg/m³)	PC/AQAL (%)	Background (µg/m³)	PC from Cumulative Sources (µg/m³)	Future Year with Proposed Development (PEC)	PEC/AQAL (%)
Most impacted location at any receptor for NOx daily mean (as the 100th percentile) (OE02)	75	µg/m³	16.4	<0.1	21.8%	25.5	5.8	47.6	63.5%
Most impacted location at any receptor for NOx annual mean (OE30)	30	µg/m³	0.4	<0.1	1.2%	10.0	0.1	10.5	35.0%

Species	AQAL (µg/m³)	Units	Proposed development PC	Road Emissions PC (µg/m³)	PC/AQAL (%)	Background (µg/m³)	PC from Cumulative Sources (µg/m³)	Future Year with Proposed Development (PEC)	PEC/AQAL (%)
Most impacted location at any receptor for Nitrogen Deposition (TE8b)	5, 6 or 10	Kg/ha/yr	0.04	0.03	1.2%	16.19	0.02	16.27	325.5%
Most impacted location at any receptor for Acid Deposition (TE7c)	Min CL min N 0.499 Min CL Max N 1.72 Min CL Max S 1.578	Keq/ha/yr	0.01	<0.01	0.3%	NA	<0.01	2.49	144.5%

Table 8-25: Results of Operational Impact Assessment for Designated Habitats – Unabated FEED 2 Scenario - Change from existing

Species	AQAL (µg/m³)	Units	Change	Change/AQAL (%)	Background (µg/m³)	Future Year with Proposed Development (PEC)	PEC/AQAL (%)
Most impacted location at any receptor for NOx daily mean (as the 100th percentile) (OE02)	75	µg/m³	-8.9	-11.8%	25.5	22.4	29.8%
Most impacted location at any receptor not	5, 6 or 10	Kg/ha/yr	0.06	1.2%	16.19	16.26	325.3%

Species	AQAL (µg/m³)	Units	Change	Change/AQAL (%)	Background (µg/m³)	Future Year with Proposed Development (PEC)	PEC/AQAL (%)
screened out for Nitrogen Deposition (TE8b)							

Decommissioning Phase

6.51.1 The predicted air quality impacts of decommissioning of the Proposed Development are considered to be comparable to, or less than, those assessed associated with construction activities. This is because the scale and nature of the activities required for decommissioning and construction are considered to be very similar and consequently the likely magnitude and duration of emissions are very similar. As such, air quality effects at sensitive receptors during the decommissioning phase are considered **not significant**.

8.7 Additional Mitigation and Enhancement Measures

Construction Phase

7.1.1 No specific additional mitigation, beyond the embedded good practice measures identified in Section 8.5, have been identified as necessary to control the risk of impacts from fugitive dust emissions from the Proposed Development.

7.2.1 The impacts from traffic associated with the construction phase have been assessed to be **not significant** in **Appendix 8-C: Air Quality Traffic Emissions Assessment** (**EN010166/APP/6.4**) and this chapter. Additional mitigation measures are therefore unlikely to have any additional benefit.

Operation Phase

7.3.1 The air quality assessment of operational impacts has assumed that the ELVs would be met for the operational Proposed Development as required under the IED and in accordance with use of BAT under the Environmental Permitting Regime. The environmental effects from operation of the Proposed Development have been identified as being **not significant** at all human health receptors for the operation of the Proposed Development and, therefore, there is no need for additional mitigation or enhancement measures.

7.4.1 Detailed modelling of predicted impacts at ecological receptors indicates that potential effects at ecological receptors as a result of the operation of the Proposed Development are largely considered to be **not significant**. Where this is not the case (i.e. at TE6, TE7b, TE7c, TE8, OE02, OE11, OE29), further interpretation of the predicted effects at ecological receptors and the determination of the significance of these effects has therefore been assessed further in **Chapter 11: Terrestrial and Aquatic Ecology** (**EN010166/APP/6.2.11**) and **Chapter 12: Marine Ecology** (**EN010166/APP/6.2.12**), which also identifies relevant mitigation measures.

7.5.1 No specific additional mitigation beyond that identified in Section 8.5 has been identified as necessary for the Proposed Development.

Decommissioning Phase

7.6.1 No specific additional mitigation has been identified as necessary to control the risk of impacts from fugitive dust emissions or traffic impacts from the Proposed Development during decommissioning.

8.8 Summary of Residual Effects

8.1.1 There are no likely residual significant effects of the Proposed Development on local air quality sensitive human health receptors or on amenity. A summary of residual effects during construction is presented in **Table 8-26,** a summary of residual effects during operation is presented in **Table 8-27** and a summary of residual effects during decommissioning is presented in **Table 8-28**.

8.2.1 An assessment of cumulative effects with other proposed developments that could interact with the effects of this Proposed Development has been carried out in **Chapter 24: Cumulative and Combined Effects. Chapter 24: Cumulative and Combined Effects** (**EN010166/APP/6.24**) as well as an assessment of the in-combination effects of multiple aspects on one receptor.

Table 8-26: Summary of Residual Effects (Construction)

Receptor	Sensitivity (value)	Magnitude of Impact	Classification of Effect (prior to Additional Mitigation)	Additional Mitigation/Enhancement Measure	Magnitude of Impact after Additional Mitigation	Residual Effect
Impacts on amenity, human health and ecological receptors from fugitive emissions of dust and particulate matter	High	Small	Negligible	N/A	Small	Negligible (Not significant)
Impacts on human health receptors from traffic emissions	High	Low	Negligible	N/A	Small	Negligible (Not significant)
Impacts on ecological receptors from traffic emissions	**See Chapter 11: Terrestrial and Aquatic Ecology** (**EN010166/APP/6.2.11**)					

Table 8-27: Summary of Residual Effects (Operation)

Receptor	Sensitivity (value)	Magnitude of Impact	Classification of Effect (prior to Additional Mitigation)	Additional Mitigation/Enhancement Measure	Magnitude of Impact after Additional Mitigation	Residual Effect
Operational Emission Effects on human health (All scenarios)	High	Imperceptible to Low	Negligible to Minor adverse (Not significant)	N/A	Imperceptible to Low	Negligible to Minor adverse (Not significant)
Operational Emission Effects on ecology (All scenarios)	**See Chapter 11: Terrestrial and Aquatic Ecology** (**EN010166/APP/6.2.11**)					

Table 8-28: Summary of Residual Effects (Decommissioning)

Receptor	Sensitivity (value)	Magnitude of Impact	Classification of Effect (prior to Additional Mitigation)	Additional Mitigation/Enhancement Measure	Magnitude of Impact after Additional Mitigation	Residual Effect
Impacts on amenity, human health and ecological receptors from fugitive	High	Small	Negligible	N/A	Small	Negligible (Not significant)

Receptor	Sensitivity (value)	Magnitude of Impact	Classification of Effect (prior to Additional Mitigation)	Additional Mitigation/Enhancement Measure	Magnitude of Impact after Additional Mitigation	Residual Effect
emissions of dust and particulate matter						
Impacts on human health receptors from traffic emissions	High	Low	Negligible	N/A	Small	Negligible (Not significant)
Impacts on ecological receptors from traffic emissions	**See Chapter 11: Terrestrial and Aquatic Ecology** (**EN010166/APP/6.2.11**)					

References

Ref 8-1 The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (SI 2017/572) [online]. London: HMSO. Available at: https://www.legislation.gov.uk/uksi/2017/572/contents/made (Accessed 29/07/2025).

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