

HyNet North West

ENVIRONMENTAL STATEMENT (VOLUME II)

Chapter 6 Air Quality

HyNet Carbon Dioxide Pipeline DCO

Planning Act 2008

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 –
Regulations 5(2)(a)

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6. AIR QUALITY

6.1. INTRODUCTION

- 6.1.1. This Chapter reports the assessment of the likely significant effects from air quality on the Development Consent Order (DCO) Proposed Development and describes:
- Relevant, legislation, policy and guidance;
 - Consultation undertaken;
 - Scope of the assessment;
 - Assessment methodology;
 - Baseline conditions;
 - Sensitive receptors;
 - Design development and embedded mitigation;
 - Assessment of likely impacts and effects;
 - Mitigation and enhancement measures;
 - Residual effects;
 - Monitoring; and
 - Next steps.

6.1.2. This Chapter and its associated figures (**Volume IV**) and appendices (**Volume III**) is intended to be read as part of the wider Environmental Statement.

6.1.3. This Chapter has been prepared by competent experts with relevant and appropriate experience, as noted in **Appendix 5.1 – Relevant Expertise and Competency, Volume III**).

6.2. LEGISLATIVE AND POLICY FRAMEWORK

- 6.2.1. A summary of the international, national, and local legislation, planning policy and guidance relevant to the air quality assessment for the DCO Proposed Development is set out below.

LEGISLATIVE FRAMEWORK

Table 6.1 – Legislation used in the Assessment

Legislation	Description
Environmental Protection Act 1990 – Control of Dust and Particulates Associated with Construction (Ref. 6.1)	<p>Section 79 of the Environmental Protection Act 1990 gives the following definitions of statutory nuisance relevant to dust and particles:</p> <p><i>“Any dust, steam, smell or other effluvia arising from industrial, trade or business premises or smoke, fumes or gases emitted from premises so as to be prejudicial to health or a nuisance”; and</i></p> <p><i>“Any accumulation or deposit which is prejudicial to health or a nuisance”.</i></p> <p>Following this, Section 80 says that where a statutory nuisance is shown to exist, the local authority must serve an abatement notice. Failure to comply with an abatement notice is an offence and if necessary, the local authority may abate the nuisance and recover expenses.</p> <p>There are no statutory limit values for dust deposition above which ‘nuisance’ is deemed to exist. Nuisance is a subjective concept, and its perception is highly dependent upon the existing conditions and the change which has occurred.</p>
Environment Act 1995 (Ref. 6.2)	<p>The Environment Act 1995 requires local authorities and other public bodies to review and document local air quality within their area. Where areas not meeting UK air quality standards are identified, an Air Quality Management Area (AQMA) is declared, and an Air Quality Action Plan (AQAP) must be drawn up to secure improvements in air quality.</p>
Environment Act 2021 (Ref. 6.3)	<p>The Environment Act 2021 introduced a requirement for the UK Government to set a minimum of 2 new air quality targets, but the targets themselves have not yet been specified. One of the targets will relate to PM_{2.5} concentrations.</p>
Well-being of Future Generations (Wales) Act 2015 (Ref. 6.4)	<p>Introduced in 2015, the Well-being of Future Generations Act requires public bodies to encourage the improvement of social, economic, environmental and cultural well-being of Wales.</p>

Legislation	Description
UK Air Quality Strategy (Ref. 6.5)	The Government's policy on air quality within the UK is set out in the Air Quality Strategy for England, Scotland, Wales, and Northern Ireland (AQS). The AQS provides a framework for reducing air pollution in the UK with the aim of meeting the requirements of European Union legislation.
Air Quality (England) Regulations 2000 (Ref. 6.6, Ref. 6.7)	Many of the objectives in the AQS have been made statutory in England for the purpose of Local Air Quality Management (LAQM).
Air Quality (Wales) Regulations 2000 (Ref. 6.8, Ref. 6.9)	Many of the objectives in the AQS have been made statutory in Wales for the purpose of Local Air Quality Management (LAQM).
Air Quality Standards Regulations 2010 (Ref. 6.10)	The Air Quality Standards Regulations were derived from the European Union Ambient Air Quality Directive and set legally binding thresholds for the concentration of pollutants in air for the protection of health and ecosystems. In the Standards Regulations the thresholds are referred to as 'limit values'. The limit values for NO ₂ and PM ₁₀ are the same concentration levels as the relevant AQS objectives and the limit value for PM _{2.5} is a concentration of 25µg/m ³ .
Air Quality Standards (Wales) Regulations 2010 (Ref. 6.11)	This document mirrors the Air Quality Standards Regulations (as above) but specifies for Welsh authorities.
Air Quality (Miscellaneous Amendments) and Revocation of Retained Direct EU Legislation (EU Exit) Regulations 2018 (SI 2018/1407) (Ref. 6.12, 6.13)	Regulation 2 of the Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020 updated the Air Quality Standards Regulations 2010 to include a limit value of 20µg/m ³ for PM _{2.5} from 2020.
Clean Air Strategy 2019 (Ref. 6.14)	Defra published the Government's Clean Air Strategy in 2019. This sets out measures which aim to reduce emissions from all sources of air pollution, making air healthier to breathe, protecting nature and boosting the economy. The Strategy also proposes tough new goals to cut public exposure to airborne particulate matter, as

Legislation	Description
	per the recommendation made by the World Health Organisation (WHO).
Clean Air Plan for Wales (Ref. 6.15)	In August 2020, the Welsh Government published its Clean Air Plan for Wales, which sets out a 10-year plan to achieve cleaner air. The Clean Air Strategy runs alongside the various statutory Air Quality Plans but considers a broader range of emission sources, including domestic properties, farming, industry, and other forms of transport such as shipping and aviation.

POLICY

National Planning Policy Framework (NPPF) (Ref. 6.16)

6.2.2. The Government's overall planning policy framework for England is described in the National Planning Policy Framework.

6.2.3. In relation to air quality, the following paragraphs in the NPPF are relevant:

- Paragraph 55, which states “*Local planning authorities should consider whether otherwise unacceptable development could be made acceptable through the use of conditions or planning obligations. Planning obligations should only be used where it is not possible to address unacceptable impacts through a planning condition.*”;
- Paragraph 174, which states “*Planning policies and decisions should contribute to and enhance the natural and local environment by: . . . e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans . . .*”;
- Paragraph 185, which states “*Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development . . .*”;
- Paragraph 186, which states “*Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and Clean Air Zones, and the cumulative impacts from individual sites in local areas . . . Planning decisions should ensure that any*

- new development in Air Quality Management Areas and Clean Air Zones is consistent with the local air quality action plan.”; and*
- Paragraph 188, which states “*The focus of planning policies and decisions should be on whether proposed development is an acceptable use of land, rather than the control of processes or emissions (where these are subject to separate pollution control regimes). Planning decisions should assume that these regimes will operate effectively. Equally, where a planning decision has been made on a particular development, the planning issues should not be revisited through the permitting regimes operated by pollution control authorities.*”

Future Wales the National Plan 2040 (Ref. 6.17)

6.2.4. Future Wales is the national development framework for Wales, setting out the spatial plan and strategy for addressing national priorities including decarbonisation and improving health and the environment. Whilst the plan states that the planning policy framework for addressing air quality is set out in Planning Policy Wales (described below), it includes an overarching requirement to minimise exposure to air pollution.

Planning Policy Wales (PPW) (Ref. 6.18)

- 6.2.5. Planning Policy Wales (PPW, Edition 11) sets the overarching planning policies for Wales. Section 6.7 of PPW sets out Welsh Government's priorities for air quality.
- 6.2.6. Para 6.75 states that the "*key planning policy principle is to consider the effects which proposed developments may have on air or soundscape quality and the effects which existing air or soundscape quality may have on proposed developments*".
- 6.2.7. Para 6.76 places a requirement on developers to address any implications on air quality management areas, not create areas of poor air quality and seek to incorporate measures which reduce overall exposure to air pollution.
- 6.2.8. Decision makers should be provided with an appropriate level of information on air quality and the proposed development, and on mitigation measures. In particular, para 6.7.13 requires careful consideration of the impacts of increased transport activity associated with development activity.
- 6.2.9. Para 6.7.8 lists mitigation measures capable of being effectively implemented which include, *inter alia*:
- Traffic management; and
 - Providing active travel infrastructure.

- 6.2.10. PPW states that care should be taken to avoid incremental development that exacerbates health and amenity inequalities through exposure to poor air quality and requires that development should be designed to prevent adverse effects to the environment but, as a minimum, to limit or constrain any effects that do occur.
- Overarching National Policy Statement (NPS) for Energy (EN-1) and NPS for Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4) (Ref. 6.19 and Ref. 6.20)**
- 6.2.11. NPS EN-1 requirements for air quality and emissions to air are broadly similar to those in NPPF and PPW.
- 6.2.12. Paragraph 5.2.6 states that significant air emissions and mitigation measures should be identified, distinguishing between project stages, and including impacts from any road traffic. Furthermore, existing air quality levels and the relative change in air quality from these levels should be described, including potential eutrophication impacts.
- 6.2.13. As in the NPPF, emphasis is placed on substantial weight being given to air quality considerations where the project would lead to a deterioration in an area or a new area where air quality already exceeds national air quality limits.
- 6.2.14. NPS EN-4 makes reference to the requirements of NPS EN-1 in relation to air quality assessments.
- 6.2.15. It should be noted that the NPS underwent review and consultation in 2021, feedback analysis is still underway, with EN-1 and EN-4 amendments currently under draft. However, the contents of the draft NPS have been considered during the preparation of this Chapter. There were no significant changes to the policy requirements for air quality within these drafts.
- Cheshire West and Chester Local Plan (Ref. 6.21)**
- 6.2.16. In 2019 the Cheshire West and Chester Local Plan (Part Two) was adopted by the council.
- 6.2.17. Policy DM 31 strictly relates to air quality and states “*development must not give rise to significant adverse impacts on health and quality of life, from air pollution. In particular, development proposals within or adjacent to an Air Quality Management Area will be expected to be designed to mitigate the impact of poor air quality on future occupiers*”.
- 6.2.18. Policy DM 31 further states “*An air quality assessment will be required for development proposals that have the potential for significant air quality impacts, including those which:*

- are classed as major development and have the potential, either individually or cumulatively, for significant emissions; or
- are likely to result in an increase in pollution levels in an Air Quality Management Area (AQMA); or
- are likely to expose people to existing sources of air pollutants”

“Where an air quality assessment identifies an unacceptable impact on or from air quality, an appropriate scheme of mitigation must be submitted, which may take the form of on-site measures or, where appropriate, a financial contribution to off-site measures.”

“Applicants must demonstrate that appropriate mitigation will be provided to ensure that the new development is appropriate for its location and unacceptable risks are avoided.”

Flintshire Local Plan (Ref. 6.22)

6.2.19. The Flintshire County Council Unitary Development Plan 2000-2015 was adopted in 2011.

6.2.20. Policy EWP 8 states “*Proposals for new waste management facilities will be permitted provided the following criteria are met:*

The development does not have a significant adverse impact on water courses, air, and soil quality and on flora and fauna; and

The development and any associated traffic does not result in unacceptable disturbance to local communities, through noise, smell, vibration, smoke or air pollution.”

GUIDANCE

Local Air Quality Management Review and Assessment Technical Guidance (Ref. 6.23)

6.2.21. Defra and the Devolved Administrations have published technical guidance for use by local authorities in their review and assessment work. This guidance, referred to in this document as LAQM.TG (16), has been used where appropriate in the assessment presented herein.

Guidance on the Assessment of Dust from Demolition and Construction (Ref. 6.24)

6.2.22. This document published by the IAQM was produced to provide guidance to developers, consultants, and environmental health officers on how to assess the impacts arising from construction activities. The emphasis of the methodology is on classifying sites according to the risk of impacts (in terms of dust nuisance, PM₁₀ impacts on public exposure and impact upon sensitive

ecological receptors) and to identify mitigation measures appropriate to the level of risk identified.

Land-use Planning & Development Control: Planning for Air Quality (Ref. 6.25)

- 6.2.23. Environmental Protection UK (EPUK) and the Institute of Air Quality Management (IAQM) have published guidance that offers comprehensive advice on: when an air quality assessment may be required; what should be included in an assessment; how to determine the significance of any air quality impacts associated with a development; and the possible mitigation measures that may be implemented to minimise these impacts.

6.3. SCOPING OPINION AND CONSULTATION

RESPONSE TO THE SCOPING OPINION

- 6.3.1. An EIA Scoping Opinion (**Appendix 1.2 – EIA Scoping Opinion, Volume III**) was received by the Applicant from the Planning Inspectorate (The Inspectorate) on 14 July 2021, including formal responses from Statutory Consultees. A full list of the responses from The Inspectorate and how these requirements have been addressed by the Applicant are set out in **Appendix 1.3 – EIA Scoping Opinion Response Tracker (Volume III)**.

CONSULTATION UNDERTAKEN TO DATE

- 6.3.2. **Table 6.2** summarises the consultation undertaken to date.

Table 6.2 – Details of Consultation Undertaken

Stakeholder	Date	Subject	Outcomes
Cheshire West and Chester Council	4 July 2022, teleconference	Summary of the air quality assessment undertaken for the DCO Proposed Development.	Cheshire West and Chester Council agree with the scope, methodology and outcomes of the air quality assessment.
Flintshire County Council	27 July 2022, teleconference	Summary of the air quality assessment undertaken for the DCO Proposed Development.	Flintshire County Council agree with the scope, methodology and outcomes of the air quality assessment.

6.4. SCOPE OF THE ASSESSMENT

- 6.4.1. The scope of this assessment can be found in **Chapter 5 - EIA Methodology (Volume II)** of this ES.

ELEMENTS SCOPED OUT OF THE ASSESSMENT

6.4.2.

The elements shown in **Table 6.3** are not considered to give rise to likely significant effects as a result of the DCO Proposed Development and have therefore been omitted from this assessment. The existing Flint Connection to PoA Terminal Pipeline is not included in the assessment.

Table 6.3 – Elements Scoped Out of the Assessment

Element Scoped Out	Justification
Assessment of fugitive emissions from the Newbuild Carbon Dioxide Pipeline	The fugitive emissions from the Newbuild Carbon Dioxide Pipeline will be negligible, due to the very low volumes of gas emitted and their immediate dispersion on release to the atmosphere.
Quantitative assessment of construction traffic impacts (exhaust emissions)	Construction traffic associated with the DCO Proposed Development is too low to trigger the need for a quantitative assessment as per EPUK/IAQM Guidance (Ref. 6.25). Further details are provided in Appendix 6.1 – Construction Dust Assessment (Volume III) .
Quantitative assessment of operational traffic impacts	As per Chapter 11 – Traffic and Transport (Volume II) the operation of the DCO Proposed Development will not result in significantly increased traffic flow or changes to traffic composition, and consequently will have no likely significant effect on air quality.

ELEMENTS SCOPED INTO THE ASSESSMENT

Construction Stage

- Qualitative construction dust, including trackout, and associated plant emissions assessment

Operation Stage

- Assessment of effects from the following CO₂ venting scenarios:
 - Planned maintenance of the Newbuild Carbon Dioxide Pipeline using Pipeline Inspection Gauges (PIGs)
 - Manifold venting during planned maintenance of the Above Ground Installations (AGIs)

Decommissioning Stage

- Assessment of effects similar to those during the Construction Stage

6.5. ASSESSMENT METHODOLOGY AND SIGNIFICANCE CRITERIA

STUDY AREA

Construction Stage

6.5.1. Following the Institute of Air Quality Management (IAQM) guidance (**Ref. 6.24**), the Study Area (**Figure 6.1: Construction Dust Study Area, Volume IV**) has been defined as the zone within the following buffers:

- 350m around the Newbuild Infrastructure Boundary (used to define the area within which construction works could occur); and/or
- 50m from the kerb-side of routes to be used by construction traffic, up to 200m from any points of exit from construction works onto the local road network, including Construction Compounds (used for consideration of effects from the track-out of dirt from site).

6.5.2. The guidance states that air quality effects as a result of the construction activities will not be significant outside of these areas.

Operation Stage

6.5.3. Operational effects relate to the venting of gas from the proposed Above Ground Installations (AGIs) during planned maintenance events. Pipeline venting will release CO₂ which may contain small traces of harmful Hydrogen Sulphide (H₂S). Planned venting will occur only at the Flint, Stanlow and Ince AGIs and during the following highly infrequent, maintenance scenarios:

- Pipeline inspection campaigns using Pipeline Inspection Gauges (PIGs) hereafter referred to as pigging campaigns; and
- Manifold venting.

6.5.4. The Study Area (**Figure 6.2 – Operational Study Area, Volume IV**) for these scenarios was set to 10km from each AGI, in line with Environment Agency guidance (**Ref. 6.26**).

Decommissioning Stage

6.5.5. When it reaches the end of its useful life the Newbuild Carbon Dioxide Pipeline and Flint Connection to PoA Terminal Pipeline will be decommissioned safely and filled with nitrogen. It is anticipated that the Carbon Dioxide Pipeline will be made safe and left in situ, but the AGIs and Block Value Stations (BVSs) are anticipated to be dismantled, and the land restored to former use.

6.5.6. The Study Area for the decommissioning stage uses the same guidance as the construction stage (**Ref. 6.24**), setting out buffer zones from the respective decommissioning boundary.

METHOD OF BASELINE DATA COLLATION

Desk Study

6.5.7. Using the Study Areas identified, a desk study was undertaken using the following sources to understand the baseline air quality of the DCO Proposed Development:

- Flintshire County Council (FCC) Air Quality Reports (**Ref. 6.27**);
- Cheshire West and Chester Council (CWCC) Air Quality Reports (**Ref. 6.28**);
- Defra's Air Pollution Background Mapping (**Ref. 6.29**);
- Multi Agency Geographic Information System Mapping (MAGIC) (**Ref. 6.30**); and
- Google Earth (**Ref. 6.31**).

Site Visit and Surveys

6.5.8. No air quality surveys were undertaken or necessary as there was sufficient baseline information obtained from the desk study.

IMPACT ASSESSMENT METHODOLOGY

Construction Dust Assessment

6.5.9. An assessment of the likely significant effects on local air quality due to the generation and dispersion of dust and PM₁₀, and emissions from construction plant during the construction stage has been undertaken using the relevant assessment framework published by the IAQM (**Ref. 6.24**), the available information at this stage of the DCO Proposed Development, and professional judgement.

6.5.10. The IAQM approach to construction dust involves:

- The identification of emission sources and construction activities (including earthworks, construction and trackout) and the estimation of their potential emission magnitude;
- The identification of sensitive receptors for air quality impacts and the assessment of the sensitivity of the area to dust and particulate matter emissions; and
- The estimation of the risk of impacts, considering the proximity of emission sources to the receptors and their magnitude.

6.5.11. The determined risk level is used to define appropriate and proportionate best practice mitigation measures as and where necessary. A summary of the IAQM assessment methodology is provided in **Appendix 6.1 - Construction Dust Assessment (Volume III)**.

- 6.5.12. The IAQM guidance states that, given the wide range of potential activities and the nature of construction sites, the guidance cannot be wholly prescriptive and that it is necessary to apply professional judgement to the assessment.
- 6.5.13. Construction activities will take place at different locations at different times, and so will not affect air quality at a strategic level within the Study Area as a whole. The construction dust assessment therefore applies the IAQM framework to the principal activities associated with individual packages of construction work, namely:
- Open trench construction;
 - Trenchless installation techniques;
 - AGI Construction; and
 - Block Valve Station (BVS) Construction.
- 6.5.14. For the assessment of impacts, the worst-case method and location of each of the above activities was assessed in line with **Chapter 5 – EIA Methodology (Volume II)**. The worst-case location was selected based on the number of sensitive receptors and their proximity to the various construction activities.
- 6.5.15. IAQM guidance recommends that, in general, impacts from construction plant emissions can be scoped out of the assessment. Notwithstanding this, the potential impacts of plant, particularly within Construction Compounds and/or proposed AGI/BVS Newbuild Infrastructure Boundaries were considered qualitatively within the IAQM risk-based framework to ensure appropriate mitigation is included within the Preliminary Design of the DCO Proposed Development.

Assessment of Operational Gas Venting

- 6.5.16. The DCO Proposed Development proposes planned venting of the Newbuild Carbon Dioxide Pipeline under the following circumstances at the Stanlow, Ince and Flint AGIs.
- Planned maintenance inspections of the Newbuild Carbon Dioxide Pipeline during pigging campaigns; and
 - Manifold venting during planned maintenance, which involves the venting of the CO₂ inlet and outlet manifolds at the AGIs.
- 6.5.17. Both pigging campaigns and manifold venting scenarios are highly infrequent. Pigging campaigns (4 PIG runs over a 2 week period) are not anticipated to take place more than once a year. Manifold venting is planned to occur once every five years.

- 6.5.18. The CO₂ within the Newbuild Carbon Dioxide Pipeline may contain impurities, principally hydrogen sulphide (H₂S). H₂S has potential health effects and is also odorous. The H₂S content of the pipeline gas will, through design specification, be limited to 5ppm. That is not to say that the H₂S content will be at 5ppm at all times, rather this is a maximum allowable concentration from an emitter.
- 6.5.19. The assessment of impacts of H₂S used the ADMS dispersion model (**Ref. 6.32**). Full details of the methodology are provided in **Appendix 6.2 - Impurities Venting (Volume III)**.
- 6.5.20. There is no large inventory venting planned during the lifetime of the DCO Proposed Development. If there is an emergency the CO₂ will be isolated using valves and/or stopples so that it is not vented through the AGIs or BVSs.

Decommissioning Stage

- 6.5.21. Much of the decommissioning stage involves the dismantling of equipment and land restoration, therefore, as with the construction stage, the IAQM Dust Assessment Guidance (**Ref. 6.24**) was used to assess the air quality effects during the Decommissioning Stage.

SIGNIFICANCE CRITERIA

Construction Dust Assessment

- 6.5.22. The IAQM assessment methodology recommends that significance criteria are only assigned to the identified risk of dust impacts occurring from a construction activity with appropriate mitigation measures in place. For almost all construction activities, the application of effective mitigation should prevent any significant effects occurring to sensitive receptors and therefore the residual effect will normally be negligible. More detail is presented in **Appendix 6.1 – Construction Dust Assessment (Volume III)**.

- 6.5.23. However, the significance of effects pre-mitigation was determined using the overall risk identified for each construction activity. A “negligible” or “low risk” as identified in the Construction Dust Assessment methodology would not represent a significant effect. If a “medium risk” or “high risk” was identified for a construction activity, this would be assumed to be a likely significant effect.

Assessment of Operational Gas Venting

- 6.5.24. There is no specific guidance available to assess the significance of potential effects arising from highly infrequent venting operations.

- 6.5.25. As such, the assessment of significance has been based on professional judgement taking into account:
- The frequency of venting operations;
 - The extent of the population potentially exposed to pollutant concentrations likely to give rise to health effects;
 - The reversibility of the potential health effects after exposure ceases;
 - The potential for odour nuisance, which takes account of the nature of the odour; and
 - The potential for mitigation.
- 6.5.26. The thresholds for potential health effects or detection of odours are set out in **Appendix 6.2 - Impurities Venting (Volume III)**.
- ### **ASSUMPTIONS AND LIMITATIONS**
- 6.5.27. The following assumptions and limitations for the EIA process were identified:
- The design data used to inform the Construction Dust Assessment, in particular onsite plant requirements, trenching methodologies and traffic movements, is indicative at this stage.
 - A worst-case approach was undertaken for the Construction Dust Assessment due to the nature of the Preliminary Design of the DCO Proposed Development (as stated in **Chapter 5 - EIA Methodology, Volume II**).
 - The design of the venting systems is being finalised and will ensure that the Newbuild Carbon Dioxide Pipeline and associated infrastructure can be operated safely and with all risks associated with the release of carbon dioxide appropriately managed.

6.6. BASELINE CONDITIONS

EXISTING BASELINE

Cheshire West and Chester Council

- 6.6.1. Cheshire West and Chester Council (CWCC) has declared four Air Quality Management Areas (AQMAs) within its administrative area and, therefore, it has been required to produce Air Quality Action Plans (AQAP). There are four AQMAs within the local authority; these are Whitby Rd/Station Rd (declared for exceedances of the annual mean NO₂ AQS objective, 2005), Frodsham (also declared for exceedances of the annual mean NO₂ AQS objective, 2015), Thornton le Moors (declared for exceedances of the 15-minute mean SO₂ objective, 2016), and Chester City Centre (declared for exceedances of the annual mean NO₂ objective, 2017).

6.6.2. CWCC measures annual mean concentrations of NO₂ within its administrative area using NO₂ diffusion tubes and automatic monitors. Details of locations and measured concentrations are shown in **Table 6.4**.

Table 6.4 – CWCC Monitored Annual Mean NO₂ Concentrations

ID	Easting	Northing	Distance from Newbuild Infrastructure Boundary (m)	Annual Mean NO₂ (µg/m³) <i>(AQS Objective: 40µg/m³)</i>				
				2016	2017	2018	2019	2020
MUL	346258	375321	50	-	-	-	16.8	13.4
MO S	341245	369610	1700	-	-	28.1	24.2	-
TLP	344103	374330	400	16	16	13	13	-

6.6.3. Diffusion tube location MUL is positioned 50m from the Newbuild Infrastructure Boundary and shows that annual mean NO₂ concentrations were well below the objective of 40µg/m³ in 2019 and 2020.

Flintshire County Council

6.6.4. Flintshire County Council (FCC) has no designated AQMAs within its administrative area and, therefore, no published AQAPs.

6.6.5. FCC measures annual mean concentrations of NO₂ within its administrative area using NO₂ diffusion tubes. Details of locations and measured concentrations are shown in **Table 6.5**.

Table 6.5 – FCC Monitored Annual Mean NO₂ Concentrations

ID	Easting	Northing	Distance from Newbuild Infrastructure Boundary (m)	Annual Mean NO₂ (µg/m³) <i>(AQS Objective: 40µg/m³)</i>				
				2016	2017	2018	2019	2020
009	329830	366682	170	20.6	17.4	17.2	17.5	13.4
023	330727	367354	390	27.9	25.9	26.7	27.8	18.6
044	332221	367723	100	24.9	23.9	24.0	24.3	-
060	329284	366504	410	12.7	17.5	17.8	17.8	15.3
066	323864	370368	1100	25.0	19.5	22.6	19.3	17.7

ID	Easting	Northing	Distance from Newbuild Infrastructure Boundary (m)	Annual Mean NO ₂ ($\mu\text{g}/\text{m}^3$) (AQS Objective: 40 $\mu\text{g}/\text{m}^3$)				
				2016	2017	2018	2019	2020
085	330718	367350	380	33.7	24.4	28.2	25.2	19.1
099	332500	367357	100	12.7	13.4	14.7	13.9	17.7
102	335594	369179	390	13.2	10.9	11.2	11.0	8.4
104	335292	368346	0	13.2	10.3	11.3	11.1	8.4
106	320126	372346	1400	-	-	-	12.5	9.6
108	324357	372008	1200	9.2	9.6	12.2	11.2	7.8
111	330614	366195	500	18.0	16.0	16.0	16.0	10.7

6.6.6. All monitoring in the vicinity of the Newbuild Infrastructure Boundary shows concentrations of annual mean NO₂ to be well below the annual mean objective of 40 $\mu\text{g}/\text{m}^3$. There were no recorded exceedances of the objective in any year from 2016. Monitoring also shows a general decrease in NO₂ concentrations from 2016 suggesting that air quality is slowly improving over time. Most of the concentrations of NO₂ during 2020 are much lower than those recorded in 2019. This is likely due to the reduction in traffic seen during the COVID-19 pandemic.

Background Air Quality Data

6.6.7. **Table 6.6** summarises the background pollutant concentrations of NO₂, PM₁₀ and PM_{2.5} for 2020 to 2022 taken from Defra's Background Mapping (**Ref 6.29**) (last updated August 2020).

Table 6.6 – Annual Mean Background Pollutant Concentrations

NO ₂ ($\mu\text{g}/\text{m}^3$) (AQS Objective: 40 $\mu\text{g}/\text{m}^3$)			PM ₁₀ ($\mu\text{g}/\text{m}^3$) (AQS Objective: 40 $\mu\text{g}/\text{m}^3$)			PM _{2.5} ($\mu\text{g}/\text{m}^3$) (AQ Standard: 20 $\mu\text{g}/\text{m}^3$)		
2020	2021	2022	2020	2021	2022	2020	2021	2022
5.4 - 17.9	5.2 - 16.9	5.1 - 16.0	9.3 - 13.9	9.2 - 13.8	9.1 - 13.7	6.0 - 8.3	5.9 - 8.2	5.9 - 8.2

6.6.8. The background air quality data shows that annual mean concentrations of NO₂, PM₁₀ and PM_{2.5} are well below their relevant objectives/standards and all pollutants are showing improvements in concentrations over recent years.

SUMMARY OF BASELINE INFORMATION

- 6.6.9. The baseline information presented above demonstrates that air quality at receptors in the vicinity of the DCO Proposed Development is good with concentrations of pollutants well below the relevant air quality objectives. Diffusion tube monitoring in 2020 measured annual mean concentrations of NO₂ well below the objective of 40µg/m³ in all years. The conclusion of good air quality is also supported by Defra's background modelling for NO₂, PM₁₀ and PM_{2.5} which show annual mean concentrations to be well below the respective national objectives in 2020 to 2022.

FUTURE BASELINE

- 6.6.10. Pollutant concentrations are anticipated to decrease in the future, most noticeably at the roadside, but also at background sites. This is due to the replacement of older, more polluting vehicles with newer, cleaner vehicles as emissions technologies improve and with the introduction of electric vehicles into the fleet. The decreasing trend is expected to be strongest for NO₂ concentrations (for which road transport is the most significant local emissions source) and weakest for particulate matter. Notwithstanding this, pollutant concentrations across the Study Area are predicted to be lower in the future than current levels, with lowered risk of exceedance of the air quality objectives.

6.7. SENSITIVE RECEPTORS

- 6.7.1. Where possible, the DCO Proposed Development has been designed to minimise proximity to sensitive receptors such as residences, schools and ecological sites. However, there are instances where the DCO Proposed Development will be constructed near receptors sensitive to changes in air quality. **Figure 6.1 – Construction Dust Study Area (Volume IV)** summarises the receptors closest to the Newbuild Infrastructure Boundary.
- 6.7.2. Due to the large extent of the DCO Proposed Development a summary of receptor locations has been provided.
- 6.7.3. For human receptors the sensitive locations have been identified as:
- Northop Hall;
 - Ewloe;
 - Mancot;
 - Mollington; and
 - Elton.
- 6.7.4. Within 50m of the Newbuild Infrastructure Boundary the following sensitive ecological sites have been identified:
- Deeside and Buckley Newt sites Special Area of Conservation (SAC);

- River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC;
- Connah's Quay Ponds and Woodland Site of Special Scientific Interest (SSSI);
- Afon Dyfrdwy (River Dee) SSSI; and
- 20 Local Wildlife Sites.

6.8. DESIGN DEVELOPMENT, IMPACT AVOIDANCE, AND EMBEDDED MITIGATION

6.8.1. The design of the vent stacks will ensure that no asphyxiating atmospheres due to CO₂ will be created during venting operations. Further, setting the limit on the concentration of H₂S in the pipeline to 5ppm will avoid the potential for health effects and will reduce impacts from odours to as low as reasonably practicable.

6.9. PRELIMINARY ASSESSMENT OF LIKELY IMPACTS AND EFFECTS

6.9.1. This section details the preliminary assessment of predicted impacts and effects for the DCO Proposed Development during both the construction and operational stages.

CONSTRUCTION STAGE

6.9.2. Construction activities that have the potential to generate and/or re-suspend dust and PM₁₀ include:

- Site clearance and preparation.
- Preparation of temporary access/egress to the DCO Proposed Development and haulage routes.
- Earthworks.
- Materials handling, storage, stockpiling and disposal.
- Use of crushing and screening equipment/plant.
- Exhaust emissions from site plant, especially when used at the extremes of their capacity and during mechanical breakdown.
- Construction of buildings, roads, and areas of hardstanding alongside fabrication processes.
- Internal and external finishing and refurbishment.
- Site landscaping after completion.

6.9.3. Most of the releases are likely to occur during the 'working week'. However, for some potential release sources (for example, exposed soil produced from significant earthwork activities) in the absence of dust control mitigation

measures, dust generation has the potential to occur 24 hours per day over the period during which such activities are to take place.

Construction Dust Assessment

- 6.9.4. The IAQM assessment methodology (**Ref. 6-24**) has been used to determine the potential dust emission magnitude for the following four different dust and PM₁₀ sources: demolition; earthworks; construction; and trackout.
- 6.9.5. The assessment was undertaken for the following construction activities proposed as part of the DCO Proposed Development:
- Open trench construction;
 - Trenchless installation techniques;
 - AGI Construction; and
 - BVS Construction.
- 6.9.6. The assessment considers three separate dust impacts from each of the activities:
- Annoyance due to dust soiling (e.g. deposition of dust on windows);
 - The risk of health effects due to an increase in exposure to PM₁₀; and
 - Harm to ecological receptors.
- 6.9.7. The full assessment of these activities is presented in **Appendix 6.1 - Construction Dust Assessment (Volume III)** but a summary of the risk of impacts is presented in **Table 6.7**.

Table 6.7 – Summary of Construction Dust Assessment

Construction Activity	Potential Impact	Earthworks	Construction	Trackout
Pipeline Trench Digging	Dust Soiling	Low Risk	Low Risk	Medium Risk
	Human Health	Negligible	Negligible	Low Risk
	Ecological	Low Risk	Low Risk	Low Risk
Trenchless installation techniques	Dust Soiling	Medium Risk	Low Risk	Medium Risk
	Human Health	Low Risk	Negligible	Low Risk
	Ecological	Medium Risk	Low Risk	Low Risk
AGI Construction	Dust Soiling	Low Risk	Negligible	Low Risk
	Human Health	Low Risk	Negligible	Low Risk

Construction Activity	Potential Impact	Earthworks	Construction	Trackout
	Ecological	Low Risk	Negligible	Low Risk
BVS Construction	Dust Soiling	Negligible	Negligible	Low Risk
	Human Health	Negligible	Negligible	Low Risk
	Ecological	Negligible	Negligible	Low Risk

6.9.8. The largest potential impacts from dust soiling would occur during trackout for pipeline trench digging and trenchless installation techniques. This is due to each activity being assigned a Medium dust emission magnitude for trackout, which can occur (as a worst-case) in High Sensitivity areas where there are more than 10 residential properties within 20m of the proposed trackout routes. This results in a Medium Risk of impacts from dust soiling during trackout for these activities, and therefore a potentially significant effect.

6.9.9. Impacts are possible for dust soiling and deposition of dust on ecological sites during trenchless installation techniques. Earthworks for these activities were assigned a Medium dust emission magnitude, which may occur in areas of Medium Sensitivity for dust soiling, and Medium Sensitivity for ecological sites. For dust soiling the worst-case area is Chester Road where there are 5 properties within 20m of the works. For ecological impacts this is the Deeside and Buckley Newt Sites SAC, located 25m from the works. This results in a Medium Risk of impacts during earthworks for these activities, and therefore a potentially significant effect.

Construction Plant Emissions

6.9.10. Only indicative information on the number and type of plant to be used during construction of the DCO Proposed Development is available. However, during the various construction activities, it is estimated that less than ten items of plant will be active at a single time on each work-front per construction activity (for example pipeline trench digging will likely involve three construction vehicles on a work-front). Due to the linear nature of the DCO Proposed Development, the good air quality of the area and the low number of receptors in proximity to the works it is unlikely that there will be a significant effect as a result of the construction plant works.

ASSESSMENT OF OPERATIONAL GAS VENTING

6.9.11. Modelling of operational venting effects was undertaken using the ADMS dispersion model as stated in **Appendix 6.2 – Impurities Venting (Volume III)**. **Table 6.8** presents the scenarios that were modelled and the maximum modelled hourly H₂S concentration.

Table 6.8 – Pigging and Manifold Venting Results

Above Ground Installation Site	Process Description	Maximum Hourly H ₂ S Concentration (µg/m ³) ^a	Meteorological Condition ^b	Flow Condition ^c	Worst-case Odour Zone (m) ^d
Ince	Manifold	20.4	G	Average, Cold	100 – 160*
	PIG Launcher	4.3	G	Average, Cold	-
Stanlow	Manifold	21.1	G	Average, Cold	100 – 140*
	PIG Receiver	4.7	G	Average, Cold	-
	PIG Launcher	10.8	G	Average, Cold	30 – 80
Flint	Manifold	24.0	G	Average, Cold	120 – 150*
	PIG Receiver	4.9	G	Average, Cold	-
	PIG Launcher	3.8	G	Average, Cold	-

^a Concentrations emboldened represent an exceedance of the odour threshold of 7 µg/m³

^b Indicative meteorological conditions are modelled that represent the possible states of the atmosphere, termed A to G. These conditions range from unstable conditions (typical of sunny days with light winds, A to C) through neutral conditions (cloudy/windy periods, C to E) to stable conditions (clear nights with light winds, F to G)

^c Flow conditions refer to state of the vented gas giving rise to maximum ground level concentrations, defined as:

- Peak = Maximum flow sustained for the hour (usually occurring directly after opening the valve)
- Average = Average flow sustained for the hour
- Ambient = Temperature of the release is the same as the ambient air
- Cold = Temperature of the release is set to -60°C

^d Range given as maximum over all flow and meteorological conditions. Zones marked with a '*' occur during peak flow conditions.

- 6.9.12. As noted in **Appendix 6.2 – Impurities Venting (Volume III)** the concentration of H₂S within the Newbuild Carbon Dioxide Pipeline is limited to 5ppm which is below the concentration at which the general population would experience noticeable but reversible health effects such as eye or throat irritation, even with prolonged exposure (20ppm, Public Health England, **Ref. 6.33**). Sensitive members of population may be impacted at lower concentrations (2ppm, Public Health England, **Ref. 6.33**). Following dilution of the pipeline gas in ambient air, H₂S concentrations were modelled below this level everywhere and under all meteorological conditions tested (including the worst-case).
- 6.9.13. To reiterate, both pigging campaigns and manifold venting scenarios are highly infrequent events.
- 6.9.14. With a 10m temporary vent stack, the results of the modelling indicate there is no risk of significant health effects in the vicinity of the AGIs during any of the scenarios outlined in **Table 6.8**. However, the modelling shows concentrations potentially above the odour threshold of 7µg/m³ for the following activities:
- Manifold venting at Ince, Stanlow and Flint AGIs;
 - PIG launching at Stanlow AGI; and
 - PIG receiving at Stanlow AGI.
- 6.9.15. The highest concentration of 24.0µg/m³ was modelled during the manifold venting at Flint AGI, using an average, cold flow condition. The largest odour risk zone occurs during the manifold venting at the Ince AGI, where during the peak flow under cold conditions (typical of flow conditions directly after the valve is opened) the risk occurs within 100m to 160m from the point of release.
- 6.9.16. The odour risk zones for each AGI during manifold venting are shown in **Figure 6.3 – H₂S Risk Zones (Volume IV)**. It is important to note that odours will not occur throughout the zone. It merely delineates the distance from the stack within which there is a risk of odours. During a venting event the specific risk will be determined by the meteorological conditions including the wind direction.
- 6.9.17. There are no residential properties within any odour zone except a residential caravan park located 130m south of the Stanlow AGI, at the outer edge of the zone. These receptors may be impacted immediately after the gas is released, under stable atmospheric conditions and a wind from a northerly sector, during manifold venting (as the largest odour zone occurs during the peak flow). It is likely that the odour zone will quickly decrease in size as the gas in the manifold empties.

- 6.9.18. The risk of odours is limited to meteorological stability class G, which is representative of extremely stable conditions. These conditions are rare and would occur only during night time. Typical conditions within the UK are stability class D, representing cloudy and/or windy conditions. There are no odours detected in meteorological conditions A – F during any of the venting scenarios (further information is set out in **Appendix 6.2 – Impurities Venting, Volume III**).
- 6.9.19. Taking into account the proximity of sensitive receptors, the likelihood of stability class G and the frequency of the venting operations, there is a minor (not significant) risk of odours during manifold venting at Ince, Stanlow and Flint AGI, and during PIG launching/receiving at Stanlow AGI.

DECOMMISSIONING STAGE

- 6.9.20. The IAQM Construction Dust Assessment methodology was used to assess the air quality effect of the Decommissioning Stage. There is no construction likely, only dismantling/demolition of the AGIs and BVSs. As such, only impacts relating to Demolition and Trackout were assessed for decommissioning the AGIs and BVSs.
- 6.9.21. For Demolition a Small dust emission magnitude was assigned as the amount of building volume to be removed per site is less than 20,000m³.
- 6.9.22. For Trackout a Medium dust emission magnitude was assigned, as the number of vehicles per site for decommissioning is currently unknown. However, it is unlikely that the number of heavy duty vehicles (HDVs) leaving the site will exceed 50 per day due to the size of the AGIs/BVSs.

Table 6.9 – Dust Emission Magnitudes during Decommissioning

Activity	Dust Emission Magnitude
Demolition	Small
Trackout	Medium

- 6.9.23. The area was defined as being of Low sensitivity to dust soiling, human health effects and ecological effects due to the rural locations of the AGIs and BVSs.
- 6.9.24. The combination of a Small dust emission magnitude and Low sensitivity area for Demolition works results in a Negligible Risk, and is therefore not significant.
- 6.9.25. The combination of a Medium dust emission magnitude and Low sensitivity for Trackout results in a Low Risk, and is therefore not significant.

Table 6.10 – Summary Dust Risk for Decommissioning Works

Potential Impact	Demolition	Trackout
Dust Soiling	Negligible	Low Risk
Human Health	Negligible	Low Risk
Ecological	Negligible	Low Risk

SIGNIFICANT EFFECTS

Construction Stage

6.9.26. The likely significant effects for Air Quality associated with the Construction Stage are summarised below:

- Dust soiling during trackout for:
 - Pipeline trench digging; and
 - Trenchless installation techniques.
- Dust soiling impacts and impacts on ecological sites during earthworks for trenchless installation techniques.

Operational Stage

6.9.27. There are no likely significant effects anticipated during the Operational Stage of the DCO Proposed Development.

Decommissioning Stage

6.9.28. There are no likely significant effects anticipated during the Decommissioning Stage of the DCO Proposed Development.

6.10. MITIGATION AND ENHANCEMENT MEASURES

6.10.1. This section sets out the preliminary avoidance, mitigation and compensation measures which are likely to be required to address the significant effects as assessed in **Section 6.9**.

CONSTRUCTION STAGE

6.10.2. The following mitigation measures are based on the outcome of the Construction Dust Assessment. The measures apply to all construction sites, except where specifically identified.

Communications

- The Stakeholder Communications Plan, that includes community engagement before work commences on site, is included as a Requirement of the **Draft DCO (Document Reference: D.3.1)**.
- Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager. Display the head or regional office contact information. (**D-AQ-003 of the REAC, Document reference: D.6.5.1**).
- A Dust Management Plan (DMP) is included as a Requirement of the **Draft DCO (Document Reference: D.3.1)**. This will include measures to control other emissions, approved by the Local Authority (**D-AQ-004 of the REAC, Document reference: D.6.5.1**).

Site Management

- Record all dust and air quality complaints, identify causes, take appropriate practicable measures to reduce emissions in a timely manner, and record the measures taken (**D-AQ-005 of the REAC, Document reference: D.6.5.1**).
- Make the complaints log available to the Local Authority when asked (**D-AQ-006 of the REAC, Document reference: D.6.5.1**).
- Record any exceptional incidents that cause dust and/or air emissions (either on or off site) and any action taken to resolve the situation in a site log book (**D-AQ-007 of the REAC, Document reference: D.6.5.1**).

Monitoring

- Undertake daily on-site and off-site inspections (up to a minimum of 50m from the site boundary), where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked (**D-AQ-008 of the REAC, Document reference: D.6.5.1**).
- Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions (**D-AQ-009 of the REAC, Document reference: D.6.5.1**).
- Agree dust deposition, dust flux, or real-time PM₁₀ continuous monitoring locations with the Local Authority (**D-AQ-004 of the REAC, Document Reference: D.6.5.1**). Continuous monitoring will be undertaken at Centralised Compounds, with visual inspections elsewhere. Further guidance is provided by IAQM on monitoring during demolition, earthworks

and construction (**D-AQ-010** of the REAC, Document reference: D.6.5.1) (Ref. 6.34).

Preparing and Maintaining the Site

- Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible (**D-AQ-012** of the REAC, Document reference: D.6.5.1).
- Where the DCO Proposed Development is constructed near sensitive receptors, solid screens or barriers will be erected around dusty activities or the site boundary that are at least as high as any stockpiles on site (**D-AQ-013** of the REAC, Document reference: D.6.5.1).
- Avoid site runoff of water or mud (**D-AQ-014** of the REAC, Document reference: D.6.5.1).
- Manage earthworks and exposed areas or soil stockpiles to prevent wind-borne dust. Use methods such as covering, seeding or using water suppression (**D-AQ-015** of the REAC, Document reference: D.6.5.1).

Operating Vehicle/Machinery and Sustainable Travel

- Ensure all vehicles switch off engines when not in use and ensure that there is no idling (**D-AQ-016** of the REAC, Document reference: D.6.5.1).
- Where reasonably practicable avoid the use of diesel or petrol powered generators, for example by using hybrid site generators. (**D-AQ-017** of the REAC, Document reference: D.6.5.1).
- Impose and signpost a maximum-speed-limit of 15mph on surfaced and 10mph on unsurfaced haul roads and work areas (**D-AQ-018** of the REAC, Document reference: D.6.5.1)
- The most practically sustainable form of transport for the delivery of goods and materials would be chosen, so far as reasonably practicable (**D-AQ-019** of the REAC, Document reference: D.6.5.1).

General Construction Phase Works

- Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems (**D-AQ-020** of the REAC, Document reference: D.6.5.1).
- Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate (**D-AQ-021** of the REAC, Document reference: D.6.5.1).
- Use covered skips (**D-AQ-022** of the REAC, Document reference: D.6.5.1).

- Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods (**D-AQ-023 of the REAC, Document reference: D.6.5.1**).

Waste Management

- There will be no bonfires or burning of waste materials (**D-AQ-040 of the REAC, Document reference: D.6.5.1**).

Measures Specific to Demolition (only applicable to Decommissioning)

- Ensure effective water suppression is used during decommissioning demolition operations (**D-AQ-037 of the REAC, Document reference: D.6.5.1**).
- Bag and remove any biological debris or damp down such material before demolition (**D-AQ-038 of the REAC, Document reference: D.6.5.1**).

Measures Specific to Earthworks

- Following excavation works, return subsoil and topsoil at the earliest suitable time of year after construction has been completed (**D-AQ-024 of the REAC, Document reference: D.6.5.1**).
- Only remove the cover in small areas during work and not all at once (**D-AQ-041 of the REAC, Document reference: D.6.5.1**).

Measures Specific to Construction

- Avoid scabbling (roughening of concrete surfaces) if possible (**D-AQ-025 of the REAC, Document reference: D.6.5.1**).
- For smaller supplies of fine powder materials ensure bags are sealed after use and stored appropriately to prevent dust (**D-AQ-026 of the REAC, Document reference: D.6.5.1**).

Measures Specific to Trackout

- All construction plant and equipment will be maintained in good working order (**D-AQ-027 of the REAC, Document reference: D.6.5.1**).
- Use water-assisted dust sweepers on the access and local roads, to remove, as necessary, any material tracked out of the site (**D-AQ-028 of the REAC, Document reference: D.6.5.1**).
- Avoid dry sweeping of large areas where possible (**D-AQ-029 of the REAC, Document reference: D.6.5.1**).
- Ensure vehicles carrying materials are appropriately covered when entering and leaving sites to prevent escape of materials during transport (**D-AQ-030 of the REAC, Document reference: D.6.5.1**).

- Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable (**D-AQ-031 of the REAC, Document reference: D.6.5.1**).
- Record all inspections of haul routes and any subsequent action in a site log book (**D-AQ-032 of the REAC, Document reference: D.6.5.1**).
- Where works are undertaken in built-up areas, install haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned (**D-AQ-033 of the REAC, Document reference: D.6.5.1**).
- Access points to the local highway will be prepared with temporary hard surfacing and wheel-washing facilities (**D-AQ-034 of the REAC, Document reference: D.6.5.1**).

OPERATIONAL STAGE

6.10.3. The modelling, based on design criteria of location specific vent diameters between 2 and 4 inches, indicates that there is a minor risk of odours during some of the venting operations. An Odour Management Plan is included as a Requirement of the **Draft DCO (Document Reference: D.3.1)**. This will be put in place to notify local residents (as early as possible) of all planned pigging campaigns and manifold venting (**D-AQ-042 of the REAC, Document reference: D.6.5.1**). Prior notification to the local residents will reduce concern amongst the population should odours be detected. The Odour Management Plan will be produced in accordance with the Environment Agency's Guidance on Odour Management (**Ref. 6.35**).

6.10.4. In order to reduce the likelihood of odours being detected pigging campaigns and manifold venting should wherever possible take place during the working day, and not overnight (**D-AQ-039 of the REAC, Document reference: D.6.5.1**). This will decrease the chances of venting occurring during a stability class G meteorological condition (clear, very stable nights) and therefore minimising the concentrations of H₂S during the operations.

DECOMMISSIONING STAGE

6.10.5. The mitigation required during decommissioning would be the same as that identified for the construction stage to minimise dust impacts during construction and the nuisance effects of odours during operation.

6.11. RESIDUAL EFFECTS

6.11.1. **Table 6.11** below summarises the residual effects associated with the DCO Proposed Development during construction, operation and decommissioning.

Table 6.11 – Summary of Residual Effects

Description of the effect	Pre-mitigation significance of effects	Mitigation measure	Residual effect
Construction			
Dust soiling effects during track-out for pipeline trench digging and trenchless installation techniques	Moderate adverse (significant)	Mitigation set out in Section 6.10 .	<i>Negligible (not significant)</i>
Dust soiling impacts during earthworks for trenchless installation techniques	Moderate adverse (significant)	Mitigation set out in Section 6.10 .	<i>Negligible (not significant)</i>
Effects to ecological sites during earthworks for trenchless installation techniques	Moderate adverse (significant)	Mitigation set out in Section 6.10 .	<i>Negligible (not significant)</i>
Operation			
Odours from pigging/manifold venting	<i>Minor adverse (not significant)</i>	Odour Management Plan Daytime venting	<i>Negligible (not significant)</i>
Decommissioning			
AGI and BVS removal	<i>Negligible (not significant)</i>	Mitigation set out in Section 6.10 .	<i>Negligible (not significant)</i>

6.12. IN-COMBINATION CLIMATE CHANGE IMPACTS

6.12.1. There are no in-combination climate change impacts identified for the air quality assessment.

6.13. MONITORING

6.13.1. The outcome of the Construction Dust Assessment (**Section 6.9**) indicates that dust monitoring should be undertaken during the Construction Stage of the DCO Proposed Development.

6.13.2. Continuous dust monitoring will be undertaken at Centralised Compounds due to potential impacts of dust from construction traffic entering and leaving the site (**D-AQ-010** of the **REAC, Document reference: D.6.5.1**). Alarms will be set up to alert the relevant local authority when concentrations of dust reach a certain threshold. The IAQM Guidance on Monitoring in the Vicinity of Demolition and Construction Sites (**Ref. 6-34**) will be used when designing the monitoring survey.

6.13.3. Where a medium risk of construction dust impacts is predicted (such as in locations of open trench digging), visual inspections of receptors in the vicinity of the works will be undertaken and results recorded in the site Inspection Log (**D-AQ-010** of the **REAC, Document reference: D.6.5.1**). The frequency of inspections would be increased during prolonged dry or windy conditions.

6.14. REFERENCES

- **Ref. 6.1** – Environmental Protection Act 1990 – Statutory Instrument 1990 No. 43
- **Ref. 6.2** – Environment Act 1995 – Statutory Instrument 1995 No. 25
- **Ref. 6.3** – Environment Act 2021 – Statutory Instrument 2021 No. 30
- **Ref. 6.4** – Well-being of Future Generations (Wales) Act 2015
- **Ref. 6.5** – Department for Environment, Food and Rural Affairs (Defra) and the Devolved Administrations (2007). The Air Quality Strategy for England, Scotland, Wales and Northern Ireland (Volumes 1 and 2)
- **Ref. 6.6** – The Air Quality (England) Regulations 2000 - Statutory Instrument 2000 No.928
- **Ref. 6.7** – The Air Quality (England) (Amendment) Regulations 2002- Statutory Instrument 2002 No.3043
- **Ref. 6.8** – The Air Quality (Wales) Regulations 2000 – Welsh Statutory Instrument 2000 No.1940
- **Ref. 6.9** – The Air Quality (Wales) (Amendment) Regulations 2002 - Welsh Statutory Instrument 2002 No.3182

- **Ref. 6.10** – The Air Quality Standards Regulations 2010 - Statutory Instrument 2010 No. 1001
- **Ref. 6.11** – The Air Quality Standards (Wales) Regulations 2010 - Statutory Instrument 2010 No. 1443
- **Ref. 6.12** – The UK formally left the EU on 31 January 2020 and new air quality legislation for the UK will be brought forward in due course. The Air Quality (Miscellaneous Amendment and Revocation of Retained Direct EU Legislation) (EU Exit) Regulations 2018 (SI 2018/1407) (see Regulation 5) makes changes to retained direct EU legislation relating to air quality, to ensure that it continues to operate effectively
- **Ref. 6.13** – The Environmental (Miscellaneous Amendments) (EU Exit) Regulations 2020 - Statutory Instrument 2020 No.000
- **Ref. 6.14** – Defra (2019). Clean Air Strategy
- **Ref. 6.15** – Welsh Government (2020). Clean Air Plan for Wales
- **Ref. 6.16** – Ministry of Housing, Communities and Local Government (July 2021) National Planning Policy Framework
- **Ref. 6.17** – Welsh Government (2021). Future Wales: The National Plan 2040
- **Ref. 6.18** – Welsh Government (2018). Planning Policy Wales
- **Ref. 6.19** – Department of Energy and Climate Change (2011). Overarching National Policy Statement for Energy (EN-1)
- **Ref. 6.20** – Department of Energy and Climate Change (2011). National Policy Statement for Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4)
- **Ref. 6.21** – Cheshire West and Chester Council (2019) Local Plan Part Two Land Allocations and Detailed Policies
- **Ref. 6.22** – Flintshire County Council (2011). Flintshire County Council Unitary Development Plan
- **Ref. 6.23** – Defra (2021) Part IV The Environment Act 1995 and Environment (Northern Ireland) Order 2002 Part III, Local Air Quality Management Technical Guidance LAQM.TG(16)
- **Ref. 6.24** – Institute of Air Quality Management (2014). Guidance on the Assessment of Dust from Demolition and Construction
- **Ref. 6.25** – Environmental Protection UK and Institute of Air Quality Management (2017) Land Use Planning & Development Control: Planning for Air Quality
- **Ref. 6.26** – Environment Agency (2021) Air emissions risk assessment for your environmental permit. Available at: <https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit>

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