

ENVIRONMENTAL STATEMENT (VOLUME II)

CHAPTER 15 – POPULATION AND HUMAN HEALTH

Padeswood Carbon Dioxide Spur Pipeline Proposed Development

Town and Country Planning Act 1990

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15. POPULATION AND HUMAN HEALTH

15.1. INTRODUCTION

- 15.1.1. This Chapter reports the assessment of the likely significant effects of the Padeswood Spur Pipeline Proposed Development on Population and Human Health and describes:
- Relevant, legislation, policy and guidance;
 - Consultation undertaken;
 - Assessment methodology;
 - Baseline conditions
 - Potential effects of the Construction, Operational and Decommissioning Stages of the Padeswood Spur Pipeline Proposed Development;
 - Potential design, mitigation, and enhancement measures;
 - Residual effects; and
 - Next steps.
- 15.1.2. This chapter (and its associated appendices) is intended to be read as part of the wider ES, with particular reference to the following chapters:
- Chapter 12 – Landscape and Visual (Document Reference: PW.3.2.12);
 - Chapter 14 – Noise and Vibration (Document Reference: PW.3.2.14);
 - Chapter 16 – Traffic and Transport (Document Reference: PW.3.2.16); and
 - Chapter 18 –Cumulative Effects (Document Reference: PW.3.2.18).

15.2. LEGISLATIVE AND POLICY FRAMEWORK

- 15.2.1. A summary of the national, and local legislation, planning policy and guidance relevant to the Population and Human Health assessment for the Padeswood Spur Pipeline Proposed Development is set out below.

LEGISLATIVE FRAMEWORK

National

Countryside and Rights of Way Act 2000 (UK Government, 2000)

- 15.2.2. The Countryside and Rights of Way Act 2000 (CROW Act) outlines public right of access to land mapped as ‘open country’ (mountain, moor, heath and down) or registered common land. These areas are known as ‘open access land’.

Equality Act 2010 (UK Government, 2010)

15.2.3. The Equality Act legally protects people from discrimination in the workplace and in wider society. It is against the law to discriminate against anyone because of the 'protected characteristics' of:

- Age;
- Being or becoming a transsexual person;
- Being married or in a civil partnership;
- Being pregnant or having a child;
- Disability;
- Race including colour, nationality, ethnic or national origin;
- Religion, belief or lack of religion/belief;
- Sex; and
- Sexual orientation

Localism Act 2011 (UK Government, 2011)

15.2.4. The Localism Act devolves power to local councils, communities, and individuals to act on local priorities, giving greater control over decisions such as housing and planning.

Wellbeing of Future Generations Act 2015 (Wales) (Future Generations Commissioner for Wales, 2015)

15.2.5. The Well-being of Future Generations Act requires public bodies in Wales to think about the long-term impact of their decisions, to work better with people, communities and each other, and to prevent persistent problems such as poverty, health inequalities and climate change.

POLICY

National

Overarching National Policy Statement (NPS) for Energy (EN-1)
(Department for Energy Security & Net Zero, 2023)

15.2.6. The NPS sets out the policy context for nationally significant energy infrastructure, as well as the need for significant amounts of large-scale energy infrastructure in meeting the UK government's energy objectives. The NPS also outlines the requirements for the submission and assessment of energy infrastructure applications and generic impacts which arise from the development of all types of energy infrastructure covered by the energy NPSs.

NPS for Natural Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4) (Department for Energy Security & Net Zero, 2024)

- 15.2.7. This NPS, taken together with EN-1, provides the primary basis for decisions by the Secretary of State on applications it receives for natural gas supply infrastructure and gas and oil pipelines.

National Planning Policy Framework (Ministry of Housing, Communities and Local Government, 2023)

- 15.2.8. Paragraph 96 of the National Planning Policy Framework (NPPF) states that planning policies and decisions should “*aim to achieve healthy, inclusive and safe places which promote social interaction, including opportunities for meetings between people who might not otherwise come into contact with each other, are safe and accessible, so that crime and disorder, and the fear of crime, do not undermine the quality of life or community cohesion, and enable and support healthy lifestyles, especially where this would address identified local health and well-being needs*”.

Planning Policy Wales: Edition 12 (Welsh Government, 2024)

- 15.2.9. Planning Policy Wales (PPW) sets out the land use planning policies of the Welsh Government. It is supplemented by a series of Technical Advice Notes (TANs), Welsh Government Circulars, and policy clarification letters, which together with PPW provide the national planning policy framework for Wales. The primary objective of PPW is to ensure that the planning system contributes towards the delivery of sustainable development and improves the social, economic, environmental and cultural well-being of Wales.

Future Wales: The National Plan (Welsh Government, 2021)

- 15.2.10. Future Wales – the National Plan 2040 is Wales’s national development framework, setting the direction for development in Wales to 2040. It aims to address key national priorities through the planning system, including sustaining and developing a vibrant economy, achieving decarbonisation and climate-resilience, developing strong ecosystems and improving the health and well-being of communities.

Planning Policy Wales, Technical Advice Note 16: Sport Recreation and Open Space (Welsh Government, 2009)

- 15.2.11. This Technical Advice Note (TAN) provides technical guidance to supplement policy set out in PPW. It advises on the role of the planning system in making provision for sport and recreational facilities and informal open spaces, as well as protecting existing facilities and open spaces in urban and rural areas in Wales.

Local

Flintshire Local Development Plan (Flintshire County Council, 2023)

- 15.2.12. Flintshire's Local Development Plan (LDP) (2015-2030) was adopted in 2023 and forms part of the statutory development plan alongside Future Wales: The National Plan 2040. The Council will use the LDP and Future Wales as the primary basis for making decisions on planning applications and development proposals.

Draft Well-being Plan, 2023-2028 (Flintshire and Wrexham Public Services Board, 2023)

- 15.2.13. The draft Plan has been published, with the final plan forecast for publication in Spring 2025. The draft Plan sets out the challenges the communities of Flintshire face and outlines how the collective work of the Public Services Board can protect and improve quality of life for residents, communities and businesses.

GUIDANCE

National

National Planning Practice Guidance, Environmental Impact Assessment (UK Government, 2021)

- 15.2.14. The aim of EIA is to protect the environment by ensuring that a local planning authority takes account of the potential significant effects of a project when deciding whether to grant planning permission. The regulations set out the procedure for identifying those projects which should be subject to an EIA, and for assessing, consulting and determining those projects which are likely to have significant environmental effects.

National Planning Practice Guidance, Open space, sports and recreation facilities, public rights of way and local green space (UK Government, 2014)

- 15.2.15. Open space should be taken into account in planning for new development and considering proposals that may affect existing open space. Open space, which includes all open space of public value, can provide health and recreation benefits to people living and working nearby; have an ecological value and contribute to green infrastructure, as well as being an important part of the landscape and setting of built development, and an important component in the achievement of sustainable development. It is for local planning authorities to assess the need for open space and opportunities for new provision in their areas, as well as identifying where development may lead to loss of

sports facilities or open spaces, creation of sports facilities or open spaces, or development which creates opportunity for sport.

National Planning Practice Guidance, Healthy and Safe Communities (UK Government, 2022)

- 15.2.16. This guidance requires that planning and health be considered together in two ways: in terms of creating environments that support and encourage healthy lifestyles, and in terms of identifying and securing the facilities needed for primary, secondary and tertiary care, and the wider health and care system (taking into account the changing needs of the population). This guidance encourages public health organisations, health service organisations, commissioners, providers, and local communities to work effectively with local planning authorities to promote healthy and inclusive communities and support appropriate health infrastructure.

Design Manual for Roads and Bridges (DMRB), Sustainability & Environment Appraisal, LA 112 Population and Human Health (Standards for Highways, 2020)

- 15.2.17. This guidance provides a framework for assessing, mitigating and reporting the effects of motorway and all-purpose trunk road projects on population and health. It introduces significance criteria that aid consistent and proportionate assessment to support the reporting of significant effects of population and human health.

Institute of Environmental Management and Assessment (IEMA), "Determining Significance for Human Health in Environmental Impact Assessment" (IEMA, 2022)

- 15.2.18. This guidance covers the consideration of health as a topic in EIA. It presents a framework that supports a proportionate approach that can apply to all scales of EIA. Practitioners of health in EIA are part of the public health endeavour, and practice must reflect this role. Legal challenge to health in EIA work is a risk and it can be reduced by following guidance. IEMA supports quality and proportionality. The guidance outlines the requirements of an EIA to identify, describe and assess the direct and indirect significant effects in an appropriate manner of a proposed development on human health. EIA commonly uses a significance framework that seeks to assign sensitivity to receptors, to assign a magnitude of change to derive the level of effect, and then to state if the effect is significant. For health, this requires the identification of relevant populations and their sensitivity, the level of change in determinants of health (magnitude), and a description of the likely significant effects to population health outcomes. The guidance provides health sensitivity and health magnitude tables. It also sets out

how to provide an evidence-based narrative to explain why the change is or is not significant for public health.

15.3. SCOPING OPINION AND CONSULTATION

RESPONSE TO THE SCOPING OPINION

- 15.3.1. An EIA Scoping Opinion was received by the Applicant from the Local Planning Authority (LPA) on 8 May 2024 (**Appendix 1.2 EIA Scoping Opinion, Document Reference: PW.3.3.1.2**), including formal responses from Statutory Consultees. The responses from the LPA in relation to Population and Human Health and how these requirements should be addressed by the Applicant are set out in **Appendix 1.3 Scoping Opinion Responses (Document Reference: PW.3.3.1.3)**.

CONSULTATION UNDERTAKEN TO DATE

- 15.3.2. In line with Chapter 15 – Population and Human Health of the Scoping Report (**Appendix 1.1 EIA Scoping Report, Document Reference PW.3.3.1.1**), information from Flintshire County Council (in relation to PRowS) has been collated as part of **Chapter 16: Traffic and Transport (Document Reference: PW.3.2.16)** of this ES, with responses considered as part of this Population and Human Health chapter assessment.
- 15.3.3. Public Health Wales were consulted in relation to the methodology for assessment of human health to be included within this Chapter of the ES. At the time of writing, no response has been received from Public Health Wales

15.4. SCOPE OF THE ASSESSMENT

- 15.4.1. The scope of this assessment has been established through an ongoing scoping process. Further information can be found in **Chapter 5: EIA Methodology (Document Reference: PW.3.2.5)** of this ES.
- 15.4.2. This section provides an update to the scope of the assessment and reiterates the evidence base for scoping out elements following further iterative assessment.

ELEMENTS SCOPED OUT OF THE ASSESSMENT

- 15.4.3. The elements shown in **Table 15-1** are not considered to give rise to likely significant effects as a result of the Padeswood Spur Pipeline Proposed Development and have therefore not been considered within this assessment.
- 15.4.4. As outlined in **Table 15-1**; all Operational Stage effects have been scoped out of the assessment. The operational elements of the Padeswood

Spur Pipeline Proposed Development only include infrastructure to facilitate the transportation of carbon dioxide (which will be captured from the Padeswood Carbon Capture and Storage (CCS) Plant, and transported to the Northop Hall AGI, which connects into the HyNetMain Onshore Carbon Dioxide Pipeline Pipeline). The Padeswood AGI is designed to operate and monitor the Padeswood Spur Pipeline via continual remote monitoring, and will not be permanently manned as it will be operated remotely.

Table 15-1 - Elements Scoped Out of the Assessment

Element Scoped Out	Justification
Operational effects on community land and assets	Once operational, current baseline conditions will return, and temporary disruption from construction will cease.
Operational effects on private property and housing	Once operational, current baseline conditions will return, and temporary disruption from construction will cease.
Construction and operational effects on businesses and their employees and customers	Given the low number of businesses located within close proximity of the Red Line Boundary, it is anticipated that access will be maintained throughout the construction period. Once operational, normal baseline conditions will continue.
Operational effects on agricultural land holdings	Once operational, agricultural land (and ground conditions) will be reinstated, and it is assumed that all temporary acquisitions of land will be returned to the operator / landowner. There is no requirement for permanent surface land acquisitions on agricultural land based on the design of the Padeswood Spur Pipeline Proposed Development.
Operational effects on users of PRowS	Once operational, access to and use of PRowS will be reinstated, and it is assumed that all previously temporarily diverted or closed routes will be open as normal.
Operational effects on Human Health	Once operational, current baseline conditions will return, and any temporary adverse effects on health as a result of construction activities will cease. There are likely to be Operational Stage benefits on human health from the reduction in carbon dioxide emissions at Padeswood Cement Works as a result of the Padeswood Spur Pipeline Proposed Development, however, given the limited number of human health receptors in the immediate vicinity of the site, there are unlikely to be any significant effects.

ELEMENTS SCOPED INTO THE ASSESSMENT

Construction Stage

15.4.5. The construction of the Padeswood Spur Pipeline Proposed Development has the potential to give rise to the following significant effects during construction, and the following elements have therefore been scoped into the assessment:

- Effects on users of community land and assets;
- Effects on residents within private property and housing;
- Effects on agricultural land holdings;
- Effects on walkers, cyclists, and horse riders; and
- Effects on human health.

Operation Stage

15.4.6. No significant operational effects are anticipated.

Decommissioning Stage

15.4.7. No significant decommissioning effects are anticipated.

15.5. ASSESSMENT METHODOLOGY AND SIGNIFICANCE CRITERIA

STUDY AREA

15.5.1. The study area for land use and accessibility, and human health is detailed below for each element of the assessment.

15.5.2. The study areas for land use and accessibility have been defined, based on the DMRB guidance Volume 11, Section 3, Part 6, LA 112 Population and Human Health (DMRB, 2020) where appropriate. The study area for human health has been informed by the IEMA guidance on 'Effective Scoping of Human Health in Environmental Impact Assessment' (IEMA, 2022). The relevant study areas outlined below are shown on **Figure 15.1**.

Land Use and Accessibility

15.5.3. The relevant study areas for land use related assessments includes the area within the Red Line Boundary, and a 500 m buffer from the edge of the Red Line Boundary. This is hereafter referred to the 'Study Area' and applies to the following elements of this Population and Human Health assessment:

- Community Land and Assets;
- Private Property and Housing;
- Agricultural Land Holdings; and

- Walkers, Cyclists and Horse Riders.

15.5.4. The assessment has considered land-use receptors within this Study Area to determine what assets may be significantly affected by the Padeswood Spur Pipeline Proposed Development, including the potential temporary or permanent loss, disturbance, and/or severance of an asset.

Human Health

15.5.5. For human health, the Study Area is focused on those locations where the land use of receptors is likely to change, and areas affected by disturbance because of construction activities or the operation of the Padeswood Spur Pipeline Proposed Development. The IEMA guidance on 'Effective Scoping of Human Health in Environmental Impact Assessment' (IEMA, 2022) notes that health effects vary between geographical areas and that the geographical scope for health assessment should consider *“where there are likely and potentially significant site and local area effects...and focus on areas where the project would exert most influence”* (IEMA, 2022), this is known as the Zone of Influence. In line with this, the Study Area for the human health assessment has been determined by the extent and characteristics of the Padeswood Spur Pipeline Proposed Development, and the communities directly and indirectly affected by the Padeswood Spur Pipeline Proposed Development.

15.5.6. Using a single geographically defined community (site-specific population) to cover a range of effects across different wider determinants of health can provide appropriate flexibility and represents a proportionate approach to assessment. As the Project is predominantly linear, there will be distinct localities and multiple separate site-specific geographic populations. The smallest jurisdiction boundaries used for the Padeswood Spur Pipeline Proposed Development assessment are Wards, which form the basis of the Study Area for health because they are the communities that are most likely to experience direct and/or the greatest impacts.

15.5.7. The various geographical area profiles used to determine a baseline for human health and provide a comparison are as follows:

- **National:** Wales;
- **Regional:** Northeast Wales;
- **County:** Flintshire; and
- **Ward:** Northop; Mold East; Argoed and New Brighton; Buckley Bistre East; and Buckley Bistre West.

METHOD OF BASELINE DATA COLLECTION

Desk Study

- 15.5.8. The assessment of Population and Human Health is qualitative and informed by desk-based study and consultation with relevant authorities and stakeholders.
- 15.5.9. The following data sources have been used for the collection of baseline information:
- Stat Wales (Stat Wales, 2023);
 - Office of National Statistics (ONS) Census data (ONS, 2023);
 - NHS Public Health Wales (NHS Public Health Wales, 2024);
 - Flintshire Public Health Services Assessment of Wellbeing (Flintshire Public Services Board, 2022);
 - Flintshire Public Rights of Way Map (Flintshire County Council, 2023); and
 - Flintshire Council Interactive Proposal Map (Flintshire County Council, 2023).

Site Visits and Surveys

- 15.5.10. No site visits or surveys have been undertaken for the purposes of the Population and Human Health assessment.

IMPACT ASSESSMENT METHODOLOGY

- 15.5.11. The methodology for this Population and Human Health assessment has been defined using DMRB LA112 Population and Human Health 2020 (DMRB, 2020) and IEMA guidance on 'Determining Significance for Human Health in Environmental Impact Assessment' (IEMA, 2022). In addition, the assessment is guided by national planning policy and guidance (particularly the NPPF (UK Government, 2024), and the Flintshire County Council Local Development Plan (Flintshire County Council, 2023), as well as past experience and professional judgement.
- 15.5.12. Assessments undertaken within the other Technical Chapters have informed the Population and Human Health assessment. These include **Chapter 6: Air Quality (Document Reference: PW.3.2.6)**, **Chapter 14: Noise and Vibration (Document Reference: PW.3.2.14)**, **Chapter 12: Landscape and Visual (Document Reference: PW.3.2.12)**, and **Chapter 16: Traffic and Transport (Document Reference: PW.3.2.16)**.
- 15.5.13. The assessment of likely significant effects on Population and Human Health as a result of the Padeswood Spur Pipeline Proposed Development covers effects categorised as either: 'Land Use and Accessibility' or 'Human Health'. As outlined in paragraph 15.4.5: all

effects assessed are Construction Stage effects; no significant Operational or Decommissioning Stage effects are anticipated and therefore both have been scoped out of the assessment.

- 15.5.14. Further details on the methodologies of each aspect of the Population and Human Health assessment have been detailed below.

Land Use and Accessibility

- 15.5.15. The Study Area for all Land Use and Accessibility receptors is: those assets which are located within the Site; which have a direct means of access within the Red Line Boundary; or which lie within the 500 m Study Area of the Red Line Boundary (see **Section 15.5** for details on the relevant Study Area for each receptor).

Effects on Community Land and Assets

- 15.5.16. Relevant receptors include community recreational land (e.g. publicly accessible parks and open spaces, nature reserves) and community facilities (such as schools, places of worship, and community centres) and the users of those facilities and assets.
- 15.5.17. The assessment will identify accessibility restrictions/severance, and the extent to which any land and assets will be temporarily or permanently lost as a result of the Padeswood Spur Pipeline Proposed Development. Changes to amenity for users of community land and assets will also be considered within the Human Health assessment, as outlined below.

Effects on Private Property or Housing

- 15.5.18. Private properties are dwellings, located on residential land that does not accommodate public space or any other community facility or asset. This classification also includes land allocated for residential development within planning policy. Effects are considered in relation to the occupants of dwellings.
- 15.5.19. The assessment will identify accessibility restrictions/severance for residents, and the extent to which any residential land or dwellings will be temporarily or permanently lost as a result of the Padeswood Spur Pipeline Proposed Development. Changes to residential amenity will also be considered within the Human Health assessment.

Effects on Agricultural Land Holdings

- 15.5.20. Agricultural land holdings describe farms and farm businesses that are operated by a landowner or tenant farmer. They describe an agricultural asset in terms of the land and any associated buildings. The assessment has identified the type of agricultural use and classification, and frequency of access likely to be required to agricultural land. The impacts on the viability of agricultural landholdings are considered in

terms of temporary or permanent loss of land, and accessibility restrictions / severance.

Effects on Walkers, Cyclists and Horse Riders

- 15.5.21. Relevant receptors include PRow and non-designated routes for walkers, cyclists, and horse riders (WCH).
- 15.5.22. The assessment has identified the impact on PRow and non-designated routes according to accessibility restrictions/severance resulting in changes to journey length and overall experience for users of those routes. Changes to amenity for users of PRow will also be considered within the Human Health assessment, as outlined below.

Human Health

- 15.5.23. There is potential for the Padeswood Spur Pipeline Proposed Development to affect human health, with health determinants likely to include: air quality; noise; loss of visual amenity; changes to the opportunities for physical activity and recreation.
- 15.5.24. Changes to amenity for users of community land and assets, residents within dwellings, and users of PRow will be considered. For the purposes of this assessment, amenity is considered to be a combination of air quality and noise levels as well as visual amenity experienced by users of these assets. Therefore, the assessment has been informed by **Chapter 6: Air Quality (Document Reference: PW.3.2.6)**, **Chapter 14: Noise and Vibration (Document Reference: PW.3.2.14)**, and **Chapter 12: Landscape and Visual (Document Reference: PW.3.2.12)**.
- 15.5.25. Specific human health effects have been assessed and detailed within **Chapter 6: Air Quality (Document Reference: PW.3.2.6)**, **Chapter 12: Landscape and Visual, (Document Reference: PW.3.2.12)**, **Chapter 14: Noise and Vibration (Document Reference: PW.3.2.14)**. The outcomes of these individual assessments have been considered within this Population and Human Health assessment to inform the overall assessment of human health, in line with IEMA Guidance.

SIGNIFICANCE CRITERIA

- 15.5.26. The sensitivity criteria and magnitude of impact for the assessment of Population and Human Health are assigned according to **Tables 15-2 and 15-3** for Construction Stage Land Use and Accessibility receptors: community land and assets; private property and housing; agricultural land holdings; and walkers, cyclists, and horse riders. Significance for Land Use and Accessibility receptors is outlined in **Table 15-4**. The sensitivity criteria and magnitude of impact for human health receptors are

outlined separately in **Tables 15-5** and **15-6**, and significance for Human Health receptors in **Table 15-7**.

Land Use and Accessibility

- 15.5.27. The significance level attributed to each likely effect will be assessed based on the sensitivity of the affected receptor(s) and the magnitude of impact arising from the Padeswood Spur Pipeline Proposed Development, in accordance with the criteria outlined in the DMRB LA 112 guidance.
- 15.5.28. In addition to the DMRB LA 112 criteria outlined in **Table 15-4** below, professional judgement and experience of similar projects has also been considered, and effects will be assessed on the basis of:
- Consideration of sensitivity of receptors and their ability to respond to change;
 - Scope for adjustment or mitigation;
 - Magnitude of impact: This entails consideration of the size of the impact on receptors in the context of the area in which the effects will be experienced;
 - Duration: This entails consideration of the duration of impact as either short, medium or long term. Impacts lasting less than a year are considered short term, impacts lasting between one and five years are considered medium term and impacts lasting five or more years are considered long term; and
 - Permanence: This involves identifying whether the impact will be permanent or temporary. Generally, impacts during the Construction Stage of the Padeswood Spur Pipeline Proposed Development are considered temporary, and impacts during the Operational Stage of the Padeswood Spur Pipeline Proposed Development are considered permanent.

Sensitivity for Land Use and Accessibility Receptors

- 15.5.29. For Land Use and Accessibility, the sensitivity criteria will be assigned based on Table 3-11 in the DMRB LA 112 guidance (DMRB, 2020)). This categorises a receptor's sensitivity as: very high; high; medium; low; and negligible and has been used to define sensitivity for Land Use and Accessibility receptors as outlined in **Table 15-2** below.

Table 15-2 - Land Use and Accessibility Sensitivity Criteria

Sensitivity	Criteria
Very High	<p>Community Land and Assets (where there is a combination of the following):</p> <ul style="list-style-type: none"> • Complete severance between communities and the land/assets, with little/no accessibility provision; • Alternatives are only available outside the local planning authority area; • The level of use is very frequent (daily); • The land/assets are used by the majority (>=50%) of the community; and / or • Facilities that are of international status and / or attract significant visitor numbers. <p>Private Property and Housing</p> <ul style="list-style-type: none"> • Existing private property or land allocated for housing located in a local authority area where the number of households are expected to increase by >25% by 2041 (ONS data); and/or • Existing housing and land allocated for housing (e.g. strategic housing sites) covering >5ha and / or >150 houses. <p>Agricultural Land Holdings</p> <ul style="list-style-type: none"> • Areas of land in which the enterprise is wholly reliant on the spatial relationship of land to key agricultural infrastructure; and • Access between land and key agricultural infrastructure is required on a frequent basis (daily). <p>Walkers, Cyclists, and Horse-riders (WCH):</p> <ul style="list-style-type: none"> • National trails and routes likely to be used for both commuting and recreation that record frequent (daily) use. Such routes connect communities with employment land uses and other services with a direct and convenient WCH route. Little/no potential for substitution. • Routes regularly used by vulnerable travellers such as the elderly, school children and people with disabilities, who could be disproportionately affected by small changes in the baseline due to potentially different needs. • Rights of way for WCH crossing roads at grade with >16,000 vehicles per day.
High	<p>Community Land and Assets (where there is a combination of the following):</p> <ul style="list-style-type: none"> • There is substantial severance between community and assets, with limited accessibility provision; • Alternative facilities are only available in the wider local planning authority area;

	<ul style="list-style-type: none"> • The level of use is frequent (weekly); • The land and assets are used by the majority ($\geq 50\%$) of the community; and • Facilities that are of national or international status and / or attract significant visitor numbers. <p>Private Property and Housing</p> <ul style="list-style-type: none"> • Private property or land allocated for housing located in a local planning authority area where the number of households are expected to increase by 16-25% by 2041 (ONS data); and/or • Existing housing and land allocated for housing (e.g. strategic housing sites) covering $>1\text{-}5\text{ha}$ and / or $>30\text{-}150$ houses <p>Agricultural Land Holdings</p> <ul style="list-style-type: none"> • Areas of land in which the enterprise is dependent on the spatial relationship of land to key agricultural infrastructure; and • Access between land and key agricultural infrastructure is required on a frequent basis (weekly). <p>Walkers, Cyclists, and Horse-riders:</p> <ul style="list-style-type: none"> • Regional trails and routes (e.g. promoted circular walks) likely to be used for recreation and to a lesser extent commuting, that record frequent (daily) use. Limited potential for substitution; and/or • Rights of way for WCH crossing roads at grade with $>8,000 - 16,000$ vehicles per day.
Medium	<p>Community Land and Assets (where there is a combination of the following):</p> <ul style="list-style-type: none"> • There is severance between communities and their land/assets but with existing accessibility provision; • Limited alternative facilities are available at a local level within adjacent communities; • The level of use is reasonably frequent (monthly); • The land and assets are used by the majority ($\geq 50\%$) of the community; and • Facilities that are of regional status and / or moderate visitor numbers. <p>Private Property and Housing</p> <ul style="list-style-type: none"> • Houses or land allocated for housing in a local authority area where the number of households are expected to increase by $>6\text{-}15\%$ by 2041 (ONS data); and/or • Existing housing and land allocated for housing (e.g. strategic housing sites) covering $<1\text{ha}$ and / or 30 houses. <p>Agricultural Land Holdings</p>

	<ul style="list-style-type: none"> • Areas of land in which the enterprise is partially dependent on the spatial relationship of land to key agricultural infrastructure; and • Access between land and key agricultural infrastructure is required on a reasonably frequent basis (monthly). <p>Walkers, Cyclists, and Horse-riders:</p> <ul style="list-style-type: none"> • Public rights of way and other routes close to communities which are used for recreational purposes (e.g. dog walking), but for which alternative routes can be taken. These routes are likely to link to a wider network of routes to provide options for longer, recreational journeys, and / or • Rights of way for WCH crossing roads at grade with >4000 – 8000 vehicles per day.
Low	<p>Community Land and Assets (where there is a combination of the following):</p> <ul style="list-style-type: none"> • Limited existing severance between community and assets, with existing and compliant accessibility provision; • Alternative facilities are available at a local level within the wider community; • The level of use is infrequent (monthly or less frequent); • The land and assets are used by the minority (>=50%) of the community; and • Facilities that are of local status and / or low visitor numbers. <p>Private Property and Housing</p> <ul style="list-style-type: none"> • Proposed development on unallocated sites providing employment with planning permission/in the planning process. <p>Agricultural Land Holdings</p> <ul style="list-style-type: none"> • Areas of land which the enterprise is not dependent on the spatial relationship of land to key agricultural infrastructure; and • Access between land and key agricultural infrastructure is required on an infrequent basis (monthly or less frequent). <p>Walkers, Cyclists, and Horse-riders:</p> <ul style="list-style-type: none"> • Routes which have fallen into disuse through past severance or which are scarcely used because they do not currently offer a meaningful route for either utility or recreational purposes, and/or • Rights of way for WCH crossing roads at grade with <4000 vehicles per day.
Negligible	<p>Community Land and Assets (where there is a combination of the following):</p> <ul style="list-style-type: none"> • No or limited severance or accessibility issues; • Alternative facilities are available within the same community;

	<ul style="list-style-type: none"> • The level of use is very infrequent (a few occasions yearly); and • The land and assets are used by the minority (>=50%) of the community. <p>Private Property and Housing</p> <ul style="list-style-type: none"> • N/A <p>Agricultural Land Holdings</p> <ul style="list-style-type: none"> • Areas of land which are infrequently used on a non-commercial basis. <p>Walkers, Cyclists, and Horse-riders:</p> <ul style="list-style-type: none"> • N/A
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Magnitude for Land Use and Accessibility Receptors

15.5.30. For Land Use and Accessibility, magnitude of impact will be assigned based on the criteria in Table 3.12 in the DMRB LA 112. This categorises magnitude of impact as: Major; Moderate; Minor; Negligible; and No Change. The magnitude of change shall be reported in line with the criteria outlined in **Table 15-3** below.

Table 15-3 - Land Use and Accessibility Magnitude of Impact Criteria

Magnitude of Impact	Criteria
Major	<p>Private property and housing, community land and assets, and agricultural land holdings:</p> <ul style="list-style-type: none"> • loss of resource and/or quality and integrity of resource; severe damage to key characteristics, features or elements. e.g. direct acquisition and demolition of buildings and direct development of land to accommodate highway assets; and/or • introduction (adverse) or removal (beneficial) of complete severance with no/full accessibility provision. <p>Walking, Cyclists, and Horse riders:</p> <ul style="list-style-type: none"> • >500m increase (adverse) / decrease (beneficial) in WCH journey length.
Moderate	<p>Private property and housing, community land and assets, and agricultural land holdings:</p> <ul style="list-style-type: none"> • partial loss of/damage to key characteristics, features or elements, e.g. partial removal or substantial amendment to access or acquisition of land compromising viability of property, community assets or agricultural holdings; and/or • introduction (adverse) or removal (beneficial) of severe severance with limited / moderate accessibility provision. <p>Walking, Cyclists, and Horse riders:</p>

	<ul style="list-style-type: none"> • >250 m – 500 m increase (adverse) or decrease (beneficial) in WCH journey length.
Minor	<p>Private property and housing, community land and assets, and agricultural land holdings:</p> <ul style="list-style-type: none"> • A discernible change in attributes, quality or vulnerability; minor loss of, or alteration to, one (maybe more) key characteristics, features or elements, e.g, amendment to access or acquisition of land resulting in changes to operating conditions that do not compromise overall viability of property, community assets or agricultural holdings; and/or • introduction (adverse) or removal (beneficial) of severance with adequate accessibility provision. <p>Walking, Cyclists, and Horse riders:</p> <ul style="list-style-type: none"> • >50 m – 250 m increase (adverse) or decrease (beneficial) in WCH journey length.
Negligible	<p>Private property and housing, community land and assets, and agricultural land holdings:</p> <ul style="list-style-type: none"> • very minor loss or detrimental alteration to one or more characteristics, features or elements. e.g. acquisition of non-operational land or buildings not directly affecting the viability of property, community assets or agricultural holdings; and/or • very minor introduction (adverse) or removal (beneficial) of severance with ample accessibility provision. <p>Walking, Cyclists, and Horse riders:</p> <ul style="list-style-type: none"> • <50 m increase (adverse) or decrease (beneficial) in WCH journey length.
No Change	<ul style="list-style-type: none"> • No loss or alteration of characteristics, features, elements or accessibility; no observable impact in either direction.

Effect Significance for Land Use and Accessibility Receptors

15.5.31. The significance of effect is derived by combining the assigned value (sensitivity) of receptors with the magnitude of change arising from the Padeswood Spur Pipeline Proposed Development. DMRB LA 112 refers to DMRB LA 104 Table 3.8.1. for determining significance of effect. This categorises significance as the following:

- **Very Large:** Effects at this level are material in the decision-making process.
- **Large:** Effects at this level are likely to be material in the decision-making process.
- **Moderate:** Effects at this level can be considered to be material decision-making factors.

- **Slight:** Effects at this level are not material in the decision-making process.
- **Neutral:** No effects or those that are beneath levels of perception, within normal bounds of variation.

15.5.32. The significance of effect will be determined using **Table 15-4** below.

Table 15-4 - Significance of Effect – Land Use and Accessibility

		Magnitude				
		No Change	Negligible	Minor	Moderate	Major
Sensitivity	Very High	Neutral	Slight	Moderate or large	Large or very large	Very Large
	High	Neutral	Slight	Slight or moderate	Moderate or large	Large or very large
	Medium	Neutral	Neutral or Slight	Slight	Moderate	Moderate or large
	Low	Neutral	Neutral or Slight	Neutral or Slight	Slight	Slight or moderate
	Negligible	Neutral	Neutral or Slight	Neutral or Slight	Neutral or Slight	Slight

15.5.33. As set out in **Chapter 5: EIA Methodology (Document Reference: PW.3.2.5)**, effects that are classified as moderate or above are considered to be significant. Effects classified below moderate are considered to be not significant.

Human Health

15.5.34. The reporting of significance for human health differs from that outlined above. This approach follows criteria set out in the IEMA 2022 Guidance on ‘Determining Significance for Human Health in Environmental Impact Assessment’ (IEMA, 2022).

Sensitivity for Human Health Receptors

A health receptor’s sensitivity is based on its ability to experience a potential impact without incurring a substantial change to its health status. The IEMA Guidance outlines health sensitivity methodology criteria which can be applied, based on the key considerations of what a population’s sensitivity is affected by, as outlined in **Table 15-5**.

Table 15-5 - Human Health and Wellbeing Sensitivity

Sensitivity	Criteria
High	<i>“high levels of deprivation (including pockets of deprivation); reliance on resources shared (between the population and the project); existing wide inequalities between the most and least healthy; a community whose outlook is predominantly anxiety or concern; people who are prevented from undertaking daily activities; dependants; people with very poor health status; and/or people with a very low capacity to adapt”.</i>
Medium	<i>“moderate levels of deprivation; few alternatives to shared resources; existing widening inequalities between the most and least healthy; a community whose outlook is predominantly uncertainty with some concern; people who are highly limited from undertaking daily activities; people providing or requiring a lot of care; people with poor health status; and/or people with a limited capacity to adapt”.</i>
Low	<i>“low levels of deprivation; many alternatives to shared resources; existing narrowing inequalities between the most and least healthy; a community whose outlook is predominantly ambivalence with some concern; people who are slightly limited from undertaking daily activities; people providing or requiring some care; people with fair health status; and/or people with a high capacity to adapt”.</i>
Very Low	<i>“very low levels of deprivation; no shared resources; existing narrow inequalities between the most and least healthy; a community whose outlook is predominantly support with some concern; people who are not limited from undertaking daily activities; people who are independent (not a carer or dependant); people with good health status; and/or people with a very high capacity to adapt”.</i>

Magnitude for Human Health Receptors

15.5.35. Magnitude describes the ‘severity’ of the experience of impact or change for a health receptor. The IEMA Guidance ‘Determining Significance In Health Impact Assessment’ outlines criteria on determining magnitude, noting that *“information on exposure, scale, frequency, duration and population extent are likely to come from*

other EIA topic Chapters or the project descriptions”. Criteria for determining health magnitude are outlined in **Table 15-6**.

Table 15-6 - Human Health and Wellbeing Magnitude of Impact

Magnitude	Criteria
High	High exposure or scale; long term duration; continuous frequency; severity predominantly related to mortality or changes in morbidity (physical or mental health) for very severe illness/ injury outcomes; majority of population affected; permanent change; substantial service quality implications.
Medium	Low exposure or medium scale; medium-term duration; frequent events; severity predominantly related to moderate changes in morbidity or major change in quality-of-life; large minority of population affected; gradual reversal; small service quality implications.
Low	Very low exposure or small scale; short term duration; occasional events; severity predominantly related to minor change in morbidity or moderate change in quality-of-life; small minority of population affected; rapid reversal; slight service quality implications.
Negligible	Negligible exposure or scale; very short term duration; one-off frequency; severity predominantly relates to a minor change in quality-of-life; very few people affected; immediate reversal once activity complete; no service quality implication.

Significance for Human Health Receptors

- 15.5.36. The IEMA Guidance notes that human health significance should apply professional judgement supported by evidence to determine what a project means for public health, and “*what it means for a change triggered by the project to be ‘important’, ‘desirable’ or ‘acceptable’ for public health*”.
- 15.5.37. For human health, applying a matrix of sensitivity and magnitude helps to identify if there is “*a relevant population (the sensitive receptor) and if there is a relevant project change to a health determinant (magnitude of impact)*”. Applying this approach, the IEMA matrix for the significance of a human health effect is outlined in **Table 15-7**.

Table 15-7 - Human Health and Wellbeing Significance

		Sensitivity			
		High	Medium	Low	Very Low
Magnitude	High	Major	Major/ Moderate	Moderate/ Minor	Minor/ Negligible
	Medium	Major/ Moderate	Moderate	Minor	Minor/ Negligible
	Low	Moderate/ Minor	Minor	Minor	Negligible
	Negligible	Minor/ Negligible	Minor/ Negligible	Negligible	Negligible

15.5.38. The IEMA Guidance outlines reasoning for significance conclusions which will be considered as part of the Human Health assessment. It notes that “*major or moderate effects are considered to be significant and minor or negligible are considered to be not significant*”; this aligns with the approach used for Land Use and Accessibility receptors outlined above, and the methodology in **Chapter 5: EIA Methodology (Document Reference: PW.3.2.5)**

ASSUMPTIONS AND LIMITATIONS

15.5.39. To ensure transparency within the EIA process, the following limitations and assumptions have been identified:

- This chapter relies on, in part, data provided by third parties (e.g. OS Mapping, Census data) which are the most up-to-date, available at the time of writing. The assessment has been carried out against a benchmark of the current baseline conditions prevailing within and around the Red Line Boundary.
- The assessment of effects on human health relies on the use of reasonable assumptions, professional judgement, and the above guidance (**Section 15.5.3**) to determine the significance of effects.

BASELINE CONDITIONS

EXISTING BASELINE

Land-use and Accessibility

Community Land and Assets

15.5.40. Community land and assets are described as *Land, buildings and infrastructure providing a service/resource to a community, e.g. open*

spaces, village greens, village halls, healthcare and education facilities etc (DMRB, 2020).

15.5.41. There are several community land and assets located within the 500m Study Area; however, none are located within the Red Line Boundary itself. These receptors are situated in the settlements along the route alignment and are centred around Mold; Mynydd Isa; New Brighton; Buckley; and Northrop Hall. A comprehensive baseline including asset type, name, location, and distance from the RLB is outlined in **Appendix 15.1. (Document Reference: PW.3.3.15.1)**. A summary of the community land and assets within the 500m Study Area is as follows:

- Three parks; one open space for informal recreation; one playing field; and two equipped playgrounds;
- One football club; one golf club; one rugby club; one cricket club; and one cricket and hockey centre;
- Two primary schools;
- Two places of worship;
- Two community centres (both of which offer additional facilities such as meeting rooms, library, mobile post office facilities, classes and events); and
- A pharmacy and an inpatient rehabilitation hospital for women with severe mental health conditions.

Private Property and Housing

15.5.42. Private property and housing includes private dwellings, land allocated for residential development, and those locations which provide direct access to private dwellings. There are several private properties located within close proximity to the Red Line Boundary. Similarly, there are access roads which provide direct access to several private properties.

15.5.43. There are no private properties within the Red Line Boundary, however, there are several residential properties located within the 500 m Study Area. A comprehensive baseline including street names, locations, estimated numbers of dwellings in each location, and distance from the Red Line Boundary is outlined in **Appendix 15.1(Document Reference: PW.3.3.15.1)**. There are an estimated 2,485 residential properties in total which fall within the 500 m Study Area, in the following locations:

- Northrop Hall, the northernmost settlement along the route alignment, located approximately 220 m to the east of the Red Line Boundary;
- New Brighton, located adjacent to the west of the Red Line Boundary;

- Bryn-Y-Baal, located approximately 200 m to the southeast of the Red Line Boundary;
- Mynydd Isa, located adjacent to the east of the Red Line Boundary;
- Mold, located adjacent to the west of the Red Line Boundary; and
- Buckley, the most southerly settlement along the route alignment, located 280 m to the north of the Red Line Boundary.

15.5.44.

In addition to these there are five housing allocations that have been identified as part of the Flintshire Local Development Plan (Flintshire County Council, 2023) which identifies planned growth and residential development in the local authority area over the period to 2030. These sites include:

- Well Street, Buckley (140 units) located 300 m north of the Red Line Boundary;
- Whitley's Depot, Buckley (34 units) located 190 m north of the Red Line Boundary;
- Land at Brook Farm, Buckley (16 units) located 430 m north of the Red Line Boundary;
- Rose Lane/ Sunnyside, Mynydd Isa (58 units) located 150 m northeast of the Red Line Boundary;
- Cae Isa, New Brighton (92 units) located 275 m east of the Red Line Boundary; and
- Mold Road and Bryn Road, New Brighton (135 units) located adjacent to the Red Line Boundary.

15.5.45.

It is understood that Well Street, Buckley and Cae Isa, New Brighton both received planning permission in summer 2024. It is not currently known whether either permission will be implemented. Additionally, the Mold Road and Bryn Road application was received in winter 2024 and had not been determined at the time of writing.

Agricultural Land Holdings

15.5.46.

The Project is predominantly a linear route, with the Study Area passing through a diverse mix of rural and semi-rural areas. As such, there is a mix of land classifications, with some land within the Study Area classified as Urban (non-agricultural) by Agricultural Land Classification (ALC) guidance (Welsh Government, 2019). The predominant ALC classification within the 500 m Study Area is level 3 (good to moderate), with some small areas of level 4 (poor) agricultural land.

15.5.47.

In the northern section of the route alignment, agricultural land between Northop Hall and Mynydd Isa are classified as grassed or grazing land; in this area this is typically characterised by open fields left to pasture, or for dairy and sheep farming. South of Mynydd Isa and

Buckley, arable and mixed arable and grazing land is used for crops, with large areas of grassed or grazing land along the remainder of the route alignment.

- 15.5.48. A number of agricultural fields will be crossed by the Padeswood Spur Pipeline Proposed Development and there are several associated farm outbuildings located within or adjacent to the Study Area. A list of the individual land parcels is outlined in **Appendix 15.1 (Document Reference: PW.3.3.15.1)**.

Walkers, Cyclists and Horse Riders

- 15.5.49. There are 23 Public Rights of Ways (PRoW) that intersect the Red Line Boundary and an additional 44 within the 500 m Study Area. These include (but are not limited to): footpaths, bridleways, non-definitive footpaths, non-definitive byways and permissive footpaths.
- 15.5.50. The Wat's Dyke Way Long Distance Recreational Route also intersects the Red Line Boundary off Bryn-y-Baal Road. It forms part of a 40-mile walking route through Flintshire, Powys, and Shropshire.
- 15.5.51. There are no designated cycle routes or long distance cycling trails in the locality, however it is acknowledged that cyclists are permitted use designated bridleways and byways (of which there are a number within the Study Area).

Human Health

Population

- 15.5.52. In 2023, Flintshire had an estimated population of 155,812 people, and was the most densely populated of the six local authorities in the North Wales region. Of this total population, 48.9% are male and 51.1% are female, which is in line with the Wales average of 49% males and 51% females (Welsh Government, 2023).

Age Breakdown

- 15.5.53. The population distribution by age group for the five wards in the Study Area is outlined in **Table 15-8**. The population distribution by age for Flintshire, and Wales is also presented for comparison. Overall, Buckley: Bistre East, Buckley: Bistre West, Mold East, and Northop have a population age profile that is similar to both county and national averages. However, the Argoed and New Brighton ward has lowest proportion of children aged 0-15 (15.1%), and the highest proportion of older adults aged 65-84 (25.7%) compared to the other jurisdictions; 6.5 percentage points higher than the Flintshire level, and 6.9 percentage points higher than the Wales level. This is in the context of an ageing

population, where between 2011 and 2021, the number of people aged 65 to 84 years increased by 19.5% across Flintshire, a slightly lower rate of change than the national (Wales) average of 21.3% in the same period (Welsh Government, 2023).

Table 15-8 - Population by age group (Welsh Government, 2023)

Age Group	Argoed and New Brighton (%)	Buckley: Bistre East (%)	Buckley: Bistre West (%)	Mold East (%)	Northop (%)	Flintshire (%)	Wales (%)
0 - 15	15.1	17.7	18.1	18.9	16.6	17.6	17.5
16-24	8.4	8.4	9.3	8.9	8.0	8.8	10.4
25-64	48.4	52.7	52.7	49.4	50.1	51.9	50.5
65-84	25.7	18.3	17.4	19.1	22.5	19.2	18.8
85 and over	2.3	3.0	2.5	3.7	2.8	2.5	2.7

Life Expectancy

15.5.54. The most up to date data available (2010-2014) for Flintshire shows that females have a higher life expectancy than males (82.4 and 79.0 respectively), which is in line with the Wales average of 82.3 and 78.2 respectively for females and males (Flintshire Public Services Board, 2022). However, there is a 11.6 year life expectancy variance for men and a 13.7 year gap for women between the most and least deprived areas of Flintshire (North Wales Regional Partnership Board, 2022).

Deprivation

15.5.55. The Welsh Index of Multiple Deprivation 2019 ranks Lower Layer Super Output Areas (LSOAs) for all of the 1,909 LSOAs in Wales, with 1 being the most deprived. In Flintshire there are 92 LSOAs. For health deprivation, 15% of the LSOAs in Flintshire are in the top 20% most deprived in Wales, these are however, concentrated near the coastline (Welsh Government, 2019). The Padeswood Spur Pipeline Proposed Development is primarily within an area with relatively low health deprivation (50% least deprived in Wales). However, there are areas of higher deprivation within and around LSOAs in Buckley and Padeswood (20-30% most deprived in Wales).

Health and Wellbeing

15.5.56. **Table 15-9** shows that the number of adults (16+) who describe their health as 'good' or 'very good' in the Study Area is broadly in line with Flintshire, and the national average. The number of adults who experience 'bad' or 'very bad' health is also in line with regional (4.3% and 1.3% respectively) and national (5.3% and 1.7% respectively) averages. Notably, a slightly lower proportion of respondents in Argoed and New Brighton ward identifying as having 'bad' or 'very bad' health however (3.3% and 0.8% respectively).

Table 15-9 - General Health and Illness (2022)

Descripti on of Health	Argoed and New Brighton (%)	Buckley: Bistre East (%)	Buckley: Bistre West (%)	Mold East (%)	Northop (%)	Flintshire (%)	Wales (%)
Very Good	47.6	47.8	42.0	45.7	52.7	47.4	46.2
Good	35.1	32.3	35.9	34.1	31.8	33.5	32.4
Fair	13.2	13.5	14.5	15.0	11.3	13.5	14.5
Bad	3.3	4.8	5.6	3.9	3.2	4.3	5.3
Very Bad	0.8	1.6	1.9	1.3	1.0	1.3	1.7

15.5.57. The 2022 North Wales Population Needs Assessment (North Wales Regional Partnership Board, 2022) stated that the main conditions affecting the regional population are hypertension (high blood pressure), diabetes, asthma, coronary heart disease, and cancer.

Disability

15.5.58. In 2021, 21.1% of Welsh residents were disabled under the equality act 2010, a 2.3% decrease from the 2011 level of 23.4%. 10% of these residents reported to be limited a lot in their day to day activities, and 11.1% reported to be limited a little. In Flintshire, the figure was lower at 18.6%. Of this, 8.3% were limited a lot and 10.3% were limited a little (ONS, 2021). In Wales, disability was most prevalent in the 45-64 year old age bracket, representing 28.3% of all disabled residents (ONS, 2021).

15.5.59. In Flintshire, 51,400 (35% of GP registered patients) patients have a chronic condition/illness. This is in line with the North Wales average of 36%. The number of people aged 18+ predicted to have a learning disability is estimated to rise by 4% from just over 2,800 in 2013 to approximately 2,900 by 2030.

Physical Activity

15.5.60. Current government guidelines recommend adults should achieve at least 150 minutes (2 1/2 hours) of moderate intensity physical activity, or 75 minutes (1 1/4 hours) of vigorous intensity activity, or a combination

of the two per week. For the 2016/17 – 2018/19 period, only 53.1 % of Welsh residents aged 16+ reported being physically active 150+ minutes each week, whilst 32.8 % report being physically active less than 30 minutes each week (Flintshire Public Services Board, 2022). In Flintshire the figure was slightly higher at 57% of residents being physically active 150+ minutes each week, and a lower 30% active for less than 30 minutes each week.

- 15.5.61. In 2018/19 – 2019/20, 60% of the population in Wales and 58% of Flintshire were reportedly overweight or obese. Flintshire sits within the health board of Betsi Cadwaladr, in which 12.1% of children aged 4-5 years were classified as obese. This is the third highest of all seven health boards in Wales (Flintshire and Wrexham Public Services Board, 2023).

Mental Health

- 15.5.62. Of 7,428 mental health facility admissions in the 2021/22 period, 1,294 or 17.4% of these came from the Betsi Cadwaladr Health Board in which Flintshire is situated. This was the second highest contributor, following Cardiff and Vale University Health Board at 19.7%.
- 15.5.63. In 2023, the suicide rate across Wales was 14.0 deaths per 100,000 (386 deaths), representing an increase of 1.5 from 2022 (339 deaths).
- 15.5.64. Approximately 8,830 (10%) children aged 5-16 years old in Wales have a mental health disorder. This is exactly mirrored in Flintshire, where 2,035 (10%) children aged 5-16 have a mental health disorder. In 2023, 55 of the 355 Flintshire children receiving care and support had reported ill mental health (Flintshire and Wrexham Public Services Board, 2023).

Air Quality and Noise Amenity

- 15.5.65. There are no Air Quality Management Areas (AQMAs) located within Flintshire. There are six noise priority areas (areas which experience high levels of environmental noise, due to road traffic or railway noise) within 500 m of the Red Line Boundary. These are primarily associated with the A55 North Wales Expressway and the A494 at Alltami (Extrium, 2024).
- 15.5.66. A full review of baseline conditions for air quality and noise receptors are outlined in **Chapter 6: Air Quality (Document Reference: PW.3.2.6)** and **Chapter 14: Noise and Vibration (Document Reference: PW.3.2.14)** of this ES.

FUTURE BASELINE

- 15.5.67. The future baseline scenario has considered the Padeswood Carbon Capture Plant as developed prior to the Padeswood Spur Pipeline Proposed Development commencing.
- 15.5.68. The population in Flintshire is set to increase by 3% over the next 20 years (Stat Wales, 2023), and changes to the distribution and structure of the population will impact on the labour market, the housing market, and demand for services and facilities.
- 15.5.69. The population distribution is also projected to continue a trend of increased older age residents, with the proportion of over 65 year olds anticipated to grow by 25.6% in Flintshire in the next 20 years (Welsh Government, 2023). An increasing older population is likely to result in greater pressure on community facilities, particularly those related to elderly care services such as medical services and care homes.
- 15.5.70. There are no other likely future baseline changes relevant to the assessment of Population and Human Health, however it is acknowledged that planned developments and allocations for residential development are likely to come forward over the medium and longer term, also placing greater pressure on the availability of, and access to community land and assets.

15.6. SENSITIVE RECEPTORS

- 15.6.1. The Population and Human Health receptors scoped into this assessment are summarised below, with their sensitivity and magnitude outlined in **Appendix 15.1(Document Reference: PW.3.3.15.1)**.. Whilst there are no identified receptors within the Red Line Boundary (aside from PRow which intersect the route), several receptors fall within the 500m Study Area.
- 15.6.2. For Land Use and Accessibility these are:
- Community Land and Assets and their users (including visitors and employees) including: three parks; one open space; one playing field; two equipped playgrounds; one football club; one golf club; one rugby club; one cricket club; one cricket and hockey centre; two primary schools; two places of worship; two community centres; a pharmacy; and an inpatient mental health hospital within the Study Area;
 - Private properties and their residents (approximately 2,485 residential dwellings within the Study Area);
 - Agricultural land holdings (predominantly ALC grade 3 land); and

- Routes used by walkers, cyclists and horse riders, including 82 footpaths and bridleways within the Study Area.

15.6.3.

The sensitivity of Land Use and Accessibility receptors is reported as either low, medium, high, or very high; in line with DMRB LA 112 guidance. A summary of the sensitivity assigned to Land Use and Accessibility receptors assessed as part of this chapter is outlined in **Table 15-10** below.

Table 15-10 - Summary of Sensitive Land Use and Accessibility Receptors

Type of Receptor	Assets	Sensitivity	Justification
Community Land and Assets	Cygnnet Delfyn House (mental health hospital); Nant Mawr Court (care home); Marleyfield House (assisted living);	High	<ul style="list-style-type: none"> • Alternative facilities are only available in the wider local planning authority area. • The level of use is frequent.
	St David's Catholic Primary School; Ysgol Mynydd Isa Primary School;	High	<ul style="list-style-type: none"> • The level of use is frequent. • The assets are used by the majority (>=50%) of the community.
	Northop Hall Cricket and Hockey Club; Clwyd Crescent Playground; Lon Yr Orsaf Park; Mold Rugby Club; New Brighton Villa FC; Mold Cricket Club; Bryn-Y-Baal Quarry; Heol Fammau Playground; The Bonc; Buckley Park; Princess Avenue Playing Fields; Old Padeswood Golf Club; New Brighton Community Centre; Caffi Isa Community Centre; Speeds Pharmacy; Village Temple	Medium	<ul style="list-style-type: none"> • Limited alternative facilities are available at a local level within adjacent communities. • The level of use is reasonably frequent. • The assets are likely to be used by >50% of the community.

	Church; St James Church		
Private Property and Housing	Gosmore Road; Bryn Lane; Moorcroft; Bryn Awelon; Ffordd Bryn Gwynant; Chambers Lane; Hoel Fammau; Bryn Clwyd; Moel Gron; Chester Road; Wood Green; Ffordd Pentre; Woodlands Close; Moldsdale Road; Mold Road; Chambers Lane; Uwch-Y-Nant; Bron-Yr-Eglwys; Rose Lane (off A549); Bryn Awelon; Nant Mawr Road; Nant Mawr Crescent; Farm Road; Powell Road	High	<ul style="list-style-type: none"> Existing housing and / or land allocated for housing covering >1-5ha and / or >30-150 houses.
	B5125; Unnamed road off B5125; Smithy Lane; Northop Country Park Housing; Unnamed road - located off Alltami Road; Bryn Y Ffynnon Farm; Alltami Road; Unnamed road adjoining Alltami Road; Bryn Offa Lane; Alltami Road; A494 New Brighton Road; Cae Isa; Oakfield Close; Argoed View; A5119; Hazel Grove; Argoed Avenue; Lindum Close; Clywd Crescent; Moel Fammau	Medium	<ul style="list-style-type: none"> Existing housing and / or land allocated for housing (e.g. strategic housing sites) covering <1ha and / or <30 houses.

	<p>Road; East View; Taylor's Farm; Argoed Hall Lane; Yr Y dlan; Bryn Road; Rockliffe; Llys Y Graig; Cherry Drive; Carol Y Bryn; Llys Gwynant; Llys Pengarth; Clos Bryn llyn; Parc Issa; Llewelyn Drive; Snowdon Avenue; Berwyn Close; Bryn Road; Aran Close; Erw Goed; Erw Fach; Hill View; Llwyn Derw; Ffordd Fer; Argoed Hall Lane; Llys Fammau; Alyn Street; Victoria Terrace; Unnamed road off Chester Road; The Avenue Bron Y Nant; Woodlands Road; Lon Yr Orsaf; Llys Derwen; Kenstone Close; A541 - Tyddyn Farm; Unnamed Road off Rose Lane Bryn Offa; Vale Drive; Llys Argoes; Pen-Y-Lon; W View Drive; Wylfa Avenue; Trem Afon; Llys Dedwydd; Penymaes; East Close; Mount Close; Cwm Close; Alyndale Avenue; Carton Road; Bryn Road; Grays Road; Mercia Drive; Wats Dyke Avenue;</p>		
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	<p>Ellesmere Road; Park Avenue; Gardd Eirlys; Moel View Road; Clwyd Avenue; Overdale Avenue; Tir Wat; The Cedars; Bryn Derwen; Crud-Y- Gwynt; Rose Lane; Well Street; Rose Lane (off A5118); Pen Y Maes; Llys Ty Coed; The Brackens; Hancock's Lane; Nant View Court; Hillsview Road; Elm Grove; Leeswood Road; Dawn Close; Princess Avenue; Becketts Lane; Old Bank Lane; Moel View Road; Brynwood Drive; Nant Glyn; Padeswood Road South; Unnamed road off Padeswood Road South; Station Lane; A5118; Unnamed Road off Padeswood Lake Road; Padeswood Drive; Unnamed Road off Meg's Lane</p>		
<p>Agricultural Land Holdings</p>	<p>Agricultural Land Parcels (all predominantly used for grazing or grassland) 5700 5615 5680 5530 5460 5265 5230 102915 4825 4995 4790 102895 4640 4862 3960 4345 3430 2980 2985 2940 3470 10340 2520 1855 2395 3440 3560 4000</p>	<p>Medium</p>	<p>Access between land and key agricultural infrastructure is required on a reasonably frequent basis (monthly).</p>

	3895 3800 3565 3890 3520 3790 3480 3175 3220 10655 102945 4025 3915 3750 3445		
Routes used by Walkers, Cyclists, and Horse Riders	414/21/30 Footpath	Medium (forms part of a wider PRow network, close to residential settlements)	Public rights of way and other routes close to communities which are used for recreational purposes (e.g. dog walking), but for which alternative routes can be taken. These routes are likely to link to a wider network of routes to provide options for longer, recreational journey.
	414/22A/20 Bridleway	Medium (forms part of a wider PRow network, with access to a main road, close to residential settlements)	
	414/22/30 Footpath	Medium (forms part of a wider PRow network, close to residential settlements)	
	414/74/10 Bridleway	Medium (forms part of a wider PRow network, with access to a main road, close to residential settlements)	

	414/23/10 Footpath	Medium (adjoins another PRow, with access to a main road, close to residential settlements)	
	414/27/10 Footpath	Medium (adjoins other PRows, with access to a main road, close to residential settlements)	
	410/120/10 Footpath	Medium (connects two main roads in a residential area)	
	410/45/30 Footpath	Medium (connects two main roads in a residential area)	
	301/20/10 Footpath	Medium (provides a pedestrian route in a residential area, understood to be well used)	
	410/47/10 Footpath	Medium (FCC noted as part of discussion)	

		s that this is a well used footpath)
	410/47/20 Footpath	Medium (forms part of a wider PRow network, with access to a main road, close to residential settlement s)
	410/45/40 Footpath	Medium (forms part of a wider PRow network, with access to a main road, close to residential settlement s)
	410/45/10 Footpath	Medium (connects two main roads in a residential area and links to another PRow)
	410/118/10 Footpath	Medium (connects two main roads in a residential area and links to another PRow)
	410/46/40 Footpath	Medium (FCC

		noted as part of discussions that this is a well used footpath)
	410/46A/10 Footpath	Medium (forms part of a wider PRow network, with access to a main road, close to residential settlements)
	411/5/10 Footpath	Medium (forms part of a wider PRow network, with access to a main road, close to residential settlements)
	410/49/10 Footpath	Medium (forms part of a wider PRow network, with access to a main road, close to residential settlements)
	410/53/20 Bridleway	Medium (FCC note that this is a well used bridleway)

		which also provides access to residential properties)
	410/52A/10 Footpath	Medium (forms part of a wider PRow network, close to residential settlements)
	410/50/20 Footpath	Medium (forms part of a wider PRow network including Wat's Dyke Way, close to residential settlements)
	301/46/10 Footpath	Medium (forms part of a wider PRow network, close to residential settlements)
	301/46/20 Footpath	Medium (forms part of a wider PRow network, close to residential settlements)
	301/48/10 Footpath	Medium (forms part of a wider PRow)

		network, close to residential settlements)
	301/47/20 Footpath	Medium (forms part of a wider PRow network, close to residential settlements)
	301/49/10 Footpath	Medium (forms part of a wider PRow network, close to residential settlements)
	301/50/20 Footpath	Medium (forms part of a wider PRow network and adjoins a main road)
	301/50/10 Footpath	Medium (forms part of a wider PRow network and adjoins a main road)
	408/75/10 Footpath	Medium (forms part of a wider PRow network)
	408/73/20 Footpath	Medium (forms part of a wider

		PRoW network)	
	408/74/40 Footpath	Medium (forms part of a wider PRoW network)	
	408/73/40 Footpath	Medium (forms part of a wider PRoW network)	
	408/73/30 Footpath	Medium (forms part of a wider PRoW network)	
	408/73/10 Footpath	Medium (forms part of a wider PRoW network)	
	301/55/10 Footpath	Medium (forms part of a wider PRoW network and adjoins a main road)	
	301/42/30 Footpath	Medium (forms part of a wider PRoW network and adjoins a main road)	
	301/43/10 Footpath	Medium (forms part of a wider PRoW network with multiple route options,	

		and adjoins several main roads)	
	301/44/20 Footpath	Medium (forms part of a wider PRow network with multiple route options, and adjoins several main roads)	
	301/44/10 Footpath	Medium (forms part of a wider PRow network with multiple route options, and adjoins several main roads)	
	414/4/10 Footpath	Medium (forms part of a wider PRow network)	
	Wat's Dyke Way Long Distance Recreational Route	Medium (as a Long Distance recreational Route, it is likely to attract users from the wider local and	

		regional area)	
	301/51/10 Footpath	Low (FCC note that this is not a well used footpath)	Routes which are infrequently used, have fallen into disuse, or which are scarcely used because they do not currently offer a meaningful route for either utility or recreational purposes. They may also lie beyond a residential area or settlement, or less frequently used than other routes in their locality as other routes offer better accessibility, quality, or a more functional option for users.
	414/19/20 Footpath	Low	
	301/54/10 Footpath	Low	
	414/72/10 Footpath	Low	
	414/21A/10 Footpath	Low	
	414/20/10 Footpath	Low	
	414/20/20 Footpath	Low	
	414/20/30 Footpath	Low	
	414/20A/10 Footpath	Low	
	414/37/10 Footpath	Low	
	414/71/10 Footpath	Low	
	414/22A/10 Footpath	Low	
	414/36/10 Footpath	Low	
	414/38/10 Footpath	Low	
	414/121/10 Footpath	Low	
	410/45/20 Footpath	Low	
	410/46/60 Footpath	Low	
	410/46/10 Footpath	Low	
	410/46/30 Footpath	Low	
	410/46/50 Footpath	Low	
	410/46/20 Footpath	Low	
	410/48/10 Footpath	Low	
	410/53/10 Footpath	Low	
	410/54/10 Footpath	Low	
	410/52/10 Footpath	Low	
	301/59/10 Footpath	Low	
	410/51/10 Footpath	Low	
	301/47/10 Footpath	Low	
	301/46/40 Footpath	Low	
	301/35/10 Footpath	Low	
	301/52/10 Footpath	Low	
	410/76/10 Footpath	Low	
	301/53/10 Footpath	Low	
	410/75/10 Footpath	Low	
	408/75/20 Footpath	Low	
	408/74/50 Footpath	Low	
	408/74/30 Footpath	Low	
	408/74/20 Footpath	Low	
	301/56/20 Footpath	Low	

	301/56/10 Footpath	Low	
	301/41/20 Footpath	Low	
	301/40/20 Footpath	Low	

15.6.4. For human health, the sensitivity of health receptors is reported differently to Land use and Accessibility. As outlined in IEMA Health Impact Assessment Guidance (IEMA, 2022) and IEMA Determining Significance For Human Health In Environmental Impact Assessment (IEMA, 2022), populations may have varying levels of sensitivity that result in greater beneficial or adverse health effects compared with the baseline.

15.6.5. The sensitivity of a population encompasses their ability to withstand exposure to associated impacts or effects, and the physiological and socio-economic factors that increase their susceptibility to the exposure. As such, for the purposes of this assessment, sensitivity focuses on the potential effects on vulnerable groups who are most likely to experience health impacts due to the nature of the Padeswood Spur Pipeline Proposed Development, including:

- Children and young people;
- Older people;
- People with existing health conditions; and
- Socially excluded or isolated groups.

15.6.6. Sensitivity for human health is reported as either very low, low, medium or high, in line with IEMA Health Impact Assessment Guidance (IEMA, 2022) and Table 7.1 in IEMA Determining Significance For Human Health In Environmental Impact Assessment (IEMA, 2022).

15.6.7. Using the baseline information set out in **Section 15.6**, the sensitivity of the population within the Study Area is deemed to be of an overall low sensitivity (although it is acknowledged that within the LSOAs in the Study Area there are localities which are likely to span multiple categories of sensitivity).

15.7. DESIGN DEVELOPMENT, IMPACT AVOIDANCE AND EMBEDDED MITIGATION

15.7.1. The following measures are committed and part of the design through embedded mitigation.

- Construction works will be programmed from 8 am to 6 pm Monday to Friday (excluding bank holidays) and from 8 am to 1 pm on Saturdays). Any exceptions to this, such as for works associated with trenchless crossings or any other unexpected requirement to

work outside of the core construction working hours, will be discussed and agreed prior to such works commencing with the Local Planning Authority Environmental Health Officer (EHO) and / or further stakeholders as appropriate. This includes, where relevant, agreeing any additional noise mitigation with the EHOs, and notifying local residents / communities of planned works outside of core construction hours prior to such works commencing.

- The Construction Contractor will nominate a Community Liaison Representative (or equivalent title) who will be a nominated competent site contact for whom the contact details will be shared with local residents and other third parties within close proximity to the construction works, and will be displayed clearly within the site compounds. The Community Liaison Representative will be responsible for engaging with any noise or vibration related matters raised by third parties.
- Construction Compounds will be set out and managed to reduce impacts on access to / from private property and housing, and community facilities as far as practicable.
- The public will be informed of the nature, timing and duration of particular construction activities and the duration of the construction works by newsletters and liaison with the Applicant.
- A stakeholder communications plan (that includes community engagement before work commences on site) will be implemented.
- Temporary PROW closures and diversions to be managed in line with the Outline Public Right of Way Management Plan (**Document Reference: PW.3.3.16.7**)
- Clear signage and directions for any alternative routes and appropriate alternative diversions will be provided and diversions clearly publicised to maintain access. Signage to advertise that businesses are open and operating as normal will also be provided where required.
- Community engagement and information regarding construction traffic activities and movements would be provided to the public. The means of communication would include online updates, letter drops, information boards and details of key contacts. The contractor would manage a 24-hour free telephone hotline and a project website.
- The site layout will be planned so that machinery and dust causing activities are located away from receptors, as far as reasonably practicable.

- When maintenance venting operations are planned to take place, signs will be placed on/near the nearby footpaths (301/55/10 and 301/56/10), warning of potential works and that odours may be experienced on the dates selected for maintenance venting.
- For complex crossings, to avoid disruption to utilities, major highways, watercourses and / or particular environmental sensitivities, specialist trenchless installation techniques will be used.
- The working width for open cut trenching installation will be kept as narrow as possible, to a standard width of 25 m where reasonably practicable.
- Agricultural soil will be suitably stored and re-used. The stripping of topsoil will be carried out with care to provide maximum protection for the soil structure (preventing topsoil and subsoil becoming mixed and avoiding soil contamination).
- Prior to the commencement of construction, during detailed design, the reinstatement of arable land, fenced boundaries, hedgerows and grassland upon completion of construction will be set out. This will include any protective fencing to areas of reinstatement that would typically remain in place to exclude livestock and allow establishment to take place.
- The Construction Contractor will be committed to promoting the use of local workforce and suppliers, wherever practicable.
- The Padeswood Spur Pipeline Proposed Development will operate without the need for any permanent on-site staff at the AGIs, which will generally be operated remotely.

15.8. PRELIMINARY ASSESSMENT OF LIKELY IMPACTS AND EFFECTS

- 15.8.1. This Section details the preliminary assessment of predicted impacts and effects for the Padeswood Spur Pipeline Proposed Development during the Construction Stage. The Operational and Decommissioning Stages have been Scoped Out of this Population and Human Health Assessment and have therefore not been assessed within the assessment of likely impacts and effects.
- 15.8.2. The likely significant effects for Population and Human Health associated with the Construction Stage are set out below.

LAND USE AND ACCESSIBILITY

Community Land and Assets

- 15.8.3. There are 22 community facilities located within 500 m Study Area for Padeswood Spur Pipeline Proposed Development, all of which are located outside the Red Line Boundary. Many of these are anticipated to be unaffected by the construction of Padeswood Spur Pipeline Proposed Development.
- 15.8.4. Whilst one of the three parks in the Study Area; The Bonc, is located approximately 90 m north of the Red Line Boundary, there will not be any disturbance to users of the park from engaging in recreational activities, and no access restrictions of land take will be required. Disturbance to the amenity of users from noise and vibration is anticipated to be minimal, with no construction traffic effects or visual disturbance. The sensitivity of The Bonc is deemed to be medium and the magnitude of change as a result of the Construction Stage is anticipated to be negligible, resulting in **Neutral (Not Significant)** temporary, short term effects on users of the park.
- 15.8.5. Cygnet Delfryn House Mental Health Facility is located off Argoed Hall Lane, approximately 70 m east of the Red Line Boundary within the Study Area. The hospital provides 24 hour care to residents, some of which are highly vulnerable. The sensitivity of Cygnet Delfryn House is therefore deemed to be high. Access for vehicles and pedestrians will be maintained throughout the Construction Stage, and ongoing discussions and engagement with the hospital are taking place to ensure there is limited potential for amenity disturbance from construction works, through embedded mitigation measures outlined in the REAC. The magnitude of change as a result of the Construction Stage is anticipated to be minor, resulting in a **Slight Adverse (Not Significant)**, temporary, short term effect, on residents and users of Cygnet Delfryn House.
- 15.8.6. The other community land and assets identified in the baseline and **Appendix 15.1(Document Reference: PW.3.3.15.1)**. are anticipated to experience no change in the magnitude of impact, which will therefore result in an overall **Neutral (Not Significant)** temporary, short term effect as a result of the construction of the Padeswood Spur Pipeline Proposed Development.

Private Property and Housing

- 15.8.7. There are 2,485 private properties located in the 500 m Study Area for Padeswood Spur Pipeline Proposed Development. The majority of these properties will remain unaffected by the construction of Padeswood Spur Pipeline Proposed Development.

- 15.8.8. A temporary construction compound will be located off the A5119 in New Brighton, with construction traffic access off the route alignment via the A494. There are three properties on the A5119, directly opposite the compound which have a direct line of sight, and have the potential to experience disruption to visual amenity and associated noise. The sensitivity of these three dwellings is deemed to be medium. The magnitude of change as a result of the Construction Stage is anticipated to be minor, resulting in *Slight Adverse (Not Significant)*, temporary, short term effect, on residents at the three dwellings on the A5119.
- 15.8.9. As part of Padeswood Spur Pipeline Proposed Development there are likely to be increases in construction traffic on rural routes with current low traffic numbers. This is likely to increase journey times on Alltami Road and Rose Lane. There are a total of 44 properties that are likely to be affected by the increased journey times in accessing their properties, and potential disruption from noise due to passing construction vehicles. These properties are all deemed to be of either a medium or high sensitivity, as outlined in **Appendix 15.1 (Document Reference: PW.3.3.15.1)**. The magnitude of change as a result of the Construction Stage is anticipated to be minor for the properties on Rose Lane (38 properties), A5118 (two properties), and Alltami Road (four properties), resulting in a *Slight Adverse (Not Significant)*, temporary, short term effect, on residents at these dwellings.
- 15.8.10. The route alignment intersects Padeswood Road South, where eight properties are situated adjacent to the Red Line Boundary. These properties have the potential to experience disruption and delays due to construction traffic movements, and adverse noise and visual amenity effects. These eight properties are deemed to be of medium sensitivity. The magnitude of change as a result of the Construction Stage is deemed to be minor, resulting in *Slight Adverse (Not Significant)* temporary, short term effects on the eight properties on Padeswood Road South.
- 15.8.11. The other residential properties and development land identified in the baseline and **Appendix 15.1** are anticipated to experience no change, or negligible effects as a result of the construction of the Padeswood Spur Pipeline Proposed Development. As such, this will result in *Neutral (Not Significant)* temporary, short term effects on the other residential properties within the Study Area.

Agricultural Land Holdings

- 15.8.12. The construction of the Padeswood Spur Pipeline Proposed Development uses open-cut trenching methods for the majority of the route. This will involve the excavation of an open trench (with a

maximum width of 25 m), lowering of the pipeline into the trench, and backfilling with excavated material. Above group temporary structures also include Temporary Construction Compounds and laydown areas.

- 15.8.13. The assessment of agricultural land holdings is based on the loss of land or resources and / or access severance, which has the potential to affect the viability of agricultural businesses. The route has been refined following liaison with stakeholders, including agricultural landowners and occupiers. Whilst there will be temporary disturbance to areas of agricultural land during construction, in consultation with landowners and occupiers, it has been determined that this will not affect the overall viability of any of the agricultural businesses. Most land parcels within the Study Area (predominantly arable, or grazing / grassed) are also understood to require low frequency of access by farmers (on a weekly, or monthly basis) due to the type of crops or activities taking place. The land holdings affected will be inaccessible for a temporary, short or medium term duration, the Project is working with local landowners to mitigate the impact of access to their land. Following completion of construction works, all agricultural land will be reinstated to its former use (predominantly grazing or arable), including consideration of effects to existing land drainage and reinstatement of any existing drainage features.
- 15.8.14. Prior to the commencement of construction, the Construction Contractor(s) will set out where reinstatement of arable land, fenced boundaries, hedgerows, and grassland upon completion of construction will take place. This will include any protective fencing to areas of reinstatement that will typically remain in place to exclude livestock and allow establishment to take place. This is outlined in the **Outline Environmental Management Plan (OEMP) (Document Reference: PW.4.1)**
- 15.8.15. The sensitivity of all agricultural land in the Study Area is classed as Medium. On the basis of the above, the magnitude of change for agricultural land is Minor, based on the limited loss of, or alteration to land. Whilst this will result in changes to the baseline operation of the agricultural land, it will not compromise the overall viability of the land holdings and associated farm businesses. It is therefore not anticipated that there will not be any significant impacts on the quantity, quality or viability of agricultural land which is temporarily affected during construction. This will result in a *Slight Adverse (Not Significant)*, temporary, short to medium term effect, on agricultural land holdings.
- 15.8.16. The only permanent take up of agricultural land will be for designated Environmental Mitigation Areas. There are potentially three such mitigation area, as outline below: These are anticipated to be an area

immediately adjacent to the west of the Deeside and Buckley Newt Sites Special Area of Conservation (Land Parcel No: 3915); and two areas west of Padeswood Road South (unnamed land parcels). Details of the proposed mitigation will be confirmed as the design progresses, however the use of these three land parcels is provisionally subject to agreement with landowners.

- 15.8.17. On the basis of the above, the magnitude of change for the four areas of permanent land take (for Environmental Mitigation Areas) agricultural land is Minor - based on the ongoing discussions and agreement with the land owners and operators, they have determined that this will not affect the overall viability of any of their agricultural businesses or ability to operate. It is therefore not anticipated that there will not be any significant impacts on the operational viability of agricultural businesses due to the permanent land take of four parcels for Environmental Mitigation Areas. This will result in a ***Slight Adverse (Not Significant)***, permanent, long term effect, on the four agricultural land parcels.

Walkers, Cyclists, and Horse Riders

- 15.8.18. Whilst many of the PRoWs which fall within the Red Line Boundary will be unaffected by the Construction Stage, there are some PRoWs which have been identified as potentially affected by the construction of the Padeswood Spur Pipeline Proposed Development.

- 15.8.19. There are several locations where PRoWs are crossed by the Padeswood Spur Pipeline Proposed Development, or which pass within close proximity to the route alignment. All of these PRoWs are either footpaths or bridleways. There is the potential for temporary disruption to PRoW access for those routes located within the Study Area as follows:

- Footpath 414/4/10 – intersected by the Red Line Boundary, and crosses the A55.
- Footpath 414/21/30 – routes approximately 30 m to the east of the Red Line Boundary.
- Bridleway 414/22A/20 – intersected by the Red Line Boundary, south of Mount Pleasant.
- Bridleway 414/74/10 – intersected by the Red Line Boundary.
- Footpath 414/27/10 – intersected by the Red Line Boundary, connecting Bryn-y-Baal to the A494.
- Footpath 410/45/30 – intersected by the Red Line Boundary, connecting to Bryn-y-Baal.

- Footpath 410/47/10 – intersected by the Red Line Boundary, connecting the A494 to Bryn Derw.
- Footpath 410/118/10 – intersected by the Red Line Boundary, connects A494 to Bryn-y-Baal
- Footpath 410/46/40 – intersected by the Red Line Boundary, connects to the A494.
- Footpath 410/46A/10 – intersected by the Red Line Boundary, crossing the A494 and providing access to Argoed Hall Lane and Cygnet Delfyn House.
- Footpath 410/49/10 – intersected by the Red Line Boundary off Rose Lane.
- Bridleway 410/53/20 - intersected by the Red Line Boundary, connects to Well Street.
- Footpath 410/52A/10 – intersected by the Red Line Boundary, near Bryn Faigas Farm.
- Footpath 410/51/10 - intersected by the Red Line Boundary, connects to A5118.
- Footpath 410/50/20 - intersected by the Red Line Boundary, connects to Padeswood Road South
- Footpath 301/46/10 - intersected by the Red Line Boundary.
- Footpath 301/46/20 - intersected by the Red Line Boundary.
- Footpath 301/49/10 - intersected by the Red Line Boundary.
- Footpath 301/51/10 - intersected by the Red Line Boundary, connects to Padeswood Road South.
- Footpath 301/50/20 - intersected by the Red Line Boundary, connects to Padeswood Road South.
- Footpath 301/50/10 – intersected by the Red Line Boundary, connects to A5118.
- Footpath 301/55/10 - intersected by the Red Line Boundary.
- Footpath 301/56/20 - intersected by the Red Line Boundary. This is proposed to be permanently closed as part of the Padeswood CCS Plant planning application.
- Bridleway 414/74/10 – adjacent but outside the Red Line Boundary.
- Footpath 301/56/10 - borders the Red Line Boundary, connecting to A5118.
- Footpath 301/42/30 – borders the Red Line Boundary, connecting to A5118 and Spon Green Farm.
- Footpath 301/43/10 – intersected by the Red Line Boundary, connecting to A5118 and Spon Green Farm.

- Footpath 301/44/20 – intersected by the Red Line Boundary, connecting A5118 to Spon Green.
- Wat's Dyke Way Long Distance Recreational Route – intersected by the RLB off Bryn-y-Baal Road.

15.8.20. Management of these PRow during the Construction Stage has been discussed with FCC, who have confirmed their agreement in principle for the proposed diversions. An Outline PRow Management Plan (PRowMMP) (**Document Reference: 3.3.16.7**) has also been submitted to accompany this application, with the final management for each PRow and the duration of their closure to be secured in the final PRowMMP to be signed off by FCC prior to the commencement of construction. The principles of management of the PRow with the potential to be affected will adhere to the following standards:

- No permanent closure of a PRow ; and
- Each affected PRow will be managed by: Remaining open (either with no intervention, or including marshalling); Temporary closure with diversions (including sequenced diversions); or Temporary closure without diversion.

15.8.21. Of the PRow with the potential to be affected by the Construction Stage, the identified management and intervention within the Outline PRowMMP is summarised in Table 15-11. Further detail of the management of these PRow and the overall significance of effect is outlined in paragraphs 15.8.22 to 15.8.28 below.

Table 15-11 - Affected PRow

PRow	Management or intervention	Magnitude of Change
Bridleway 414/74/10 Footpaths 414/27/10; 301/46/10; 301/46/20; 301/49/10; 301/51/10; 301/50/10; 301/56/10; and 301/56/20	None – will remain open with no requirement for closure or diversion.	No change
Footpaths 410/46A/10 and 410/52A/10 Wat's Dyke Long Distance Recreational Route	Remain open with temporary crossing marshals.	Negligible
Bridleway 414/22A/20	Remain open, except during open cut trenching - temporary diversion of less than 50m.	Negligible
Footpath 301/42/30	Remain open except for short temporary closure for widening of entrance. Then remain open with temporary crossing marshals.	Negligible
Bridleway 410/53/20 Footpaths 410/45/30; 410/47/10; 410/46/40; 410/49/10; 301/50/20; and 301/43/10	Sequenced closures, with temporary diversions for short durations.	Negligible
Footpaths 410/118/10; 410/50/20; and 301/55/10	Temporary closure with diversion of less than 250m.	Minor

15.8.22. Of the PRow identified as having the potential to experience impacts during construction, one bridleway (414/74/10) and eight footpaths (414/27/10; 301/46/10; 301/46/20; 301/49/10; 301/51/10; 301/50/10; 301/56/10; and 301/56/20) will remain open with no requirement for closure identified (see **Chapter 16: Traffic and Transport, Document Reference: PW.3.2.16** for further detail). Therefore, the magnitude of change for these PRow is No Change, resulting in an overall **Neutral (Not Significant)** temporary, short term effect on users of these PRow.

15.8.23. Two footpaths (410/46A/10 and 410/52A/10) and Wat's Dyke Long Distance Recreational Route will remain open, with temporary crossing marshals in place when the movement of construction vehicle traffic is required). This approach has been agreed as preferable, as closures are anticipated to be infrequent and unlikely to disrupt usage of the

footpaths or give rise to delays in users' journeys. Therefore, the magnitude of change for these PRow is negligible, resulting in an overall ***Slight Adverse (Not Significant)*** temporary, short term effect on users.

- 15.8.24. One bridleway (414/22A/20) will remain open, with the exception of a short duration when open cut trenching is taking place, and localised temporary diversions will be implemented during this time. The localised diversion is anticipated to add less than 50m additional journey length for users and will not disrupt usage of the bridleway or give rise to a notable change in journey length. Therefore, the magnitude of change for this bridleway is negligible, resulting in an overall ***Slight Adverse (Not Significant)*** temporary, short term effect on users.
- 15.8.25. One footpath (301/42/30) will remain open, with the exception of a short duration when works will be undertaken to widen an entrance for construction vehicles. Given the very short and temporary nature of this closure, no diversion will be in place during this time. During the rest of the Construction Stage, the footpath will remain open, with temporary crossing marshals in place when the movement of construction vehicle traffic is required. Therefore, the magnitude of change for this footpath is negligible, resulting in an overall ***Slight Adverse (Not Significant)*** temporary, short term effect on users.
- 15.8.26. There are five footpaths (410/45/30; 410/47/10; 410/46/40; 410/49/10; 301/50/20) and one bridleway (410/53/20) which will be temporarily closed in sequence. This means that a partial closure of these PRow will take place as works cross the PRow from one end to another. When this takes place, a temporary diversion will be provided at each stage of the sequencing. In addition, footpath 301/43/10 will be temporarily closed in sequenced, with access for farm vehicles routing to Spon Green Farm to be retained for the duration of the construction works. The sequenced closures of these PRow will be for short periods of time, and are unlikely to disrupt usage of the footpaths or give rise to delays in users' journeys. Therefore, the magnitude of change for these PRow is negligible, resulting in an overall ***Slight Adverse (Not Significant)*** temporary, short term effect on users.
- 15.8.27. Three footpaths (410/118/10; 410/50/20; 301/55/10) will be temporarily closed with a diversion around the perimeter of the Red Line Boundary. These diversions may increase journey length slightly; however it is understood that no diversion has an increase of more than 250m in total length. As such, whilst this may give rise to a minor delay in journey time for users, this is unlikely to disrupt overall usage of the footpaths. Therefore, the magnitude of change for these PRow is

minor, resulting in an overall *Slight Adverse (Not Significant)* temporary, short term effect on users.

- 15.8.28. Three footpaths (414/4/10; 301/44/20; and 414/21/30) will be temporarily closed during construction, with no diversion in place. This is because there is no suitable or practicable alternative of similar quality and level of access, or in the case of 414/4/10, does not connect to additional PRowS and noted by FCC as not requiring an alternative route in place. Whilst these closures will be for a maximum period of six months, it is acknowledged that this will give rise to disruption for users. The Applicant has discussed these closures with FCC who have confirmed their agreement in principle for diversions (see **Chapter 16: Traffic and Transport, Document Reference: PW.3.2.16** for further detail). As outlined above, the management of, and duration of their closure will be secured in the final PRow Management Plan to be signed off by FCC prior to the commencement of construction. On the basis of the above, the magnitude of change for these PRow is minor, resulting in an overall *Slight Adverse (Not Significant)* temporary, short term effect on users.

HUMAN HEALTH

- 15.8.29. The likely effects for human health associated with the Construction Stage are set out below and have been informed by other Chapters of this ES. The effects outlined below for each Chapter are assuming embedded mitigation measures are in place, but prior to the implementation of any additional mitigation required. Consequently, these will be mitigated as set out in each of the relevant Chapters.

Table 15-12 - Human Health Considerations in other Topic Chapters

Technical Topic / Chapter	Details
<p>Chapter 6: Air Quality (Document Reference: PW.3.2.6)</p>	<p>The air quality assessment considers the potential impacts of dust on human health, dust soiling, and designated ecological sites, and the impacts of emissions from construction plant. The chapter notes that there are no AQMAs within the FCC jurisdiction.</p> <p>The chapter identifies that there is a Low Risk or Negligible Risk to Human Health as a result of the earthworks, construction, and trackout activities during all elements of the Construction Stage. It is also noted that it is unlikely there will be a significant effect from construction plant emissions. Assuming embedded mitigation measures, the overall impact on human health as a result of construction dust and air quality emissions is considered to be Low, and therefore not significant.</p>
<p>Chapter 14: Noise and Vibration (Document Reference: PW.3.2.14)</p>	<p>The noise assessment considers airborne noise effects as a result of HGV movements on the local road network associated with construction traffic movements, and noise effects arising from construction of the Padeswood Spur Pipeline Proposed Development. The noise sensitive receptors considered include residential dwellings, hospitals, schools, nurseries, care homes, and places of worship.</p> <p>The chapter identifies that as a result of open cut trenching activities, noise sensitive residential receptors will experience predominantly low or medium magnitude noise impacts, with some high impacts. Noise-sensitive receptors likely to experience a magnitude of impact classified as either medium or high from the open trenching construction activities are located along the A5118, with several situated south of Buckley. Additional receptors are found on Padeswood Road South, Mold Road (south of Mynydd Isa), Well Street, and Rose Lane to the east of Mold. These are predominantly residential receptors, as well as some community assets. The chapter notes however, that although the assessment results exhibit a medium or high magnitude of impact on the receptors, it is not considered to be a significant effect due to the daytime working, and short duration of this construction activity in each location. The likely change in noise levels due to the generation of additional traffic movements during construction has been assessed as not significant. Vibration effects will also be not significant.</p>

<p>Chapter 12: Landscape and Visual (Document Reference: PW.3.2.12)</p>	<p>The landscape and visual assessment considers changes to the landscape character and visual amenity of sensitive receptors. The visually sensitive receptors identified are residents within settlements and recreational users of PRow.</p> <p>There is the potential for temporary changes to visual amenity during construction, with potential impacts for residents and recreational users of PRow. Assuming embedded mitigation measures, the impact of changes to visual amenity has the potential to cause significant adverse effects as receptors are likely to experience a significant degree of change, with adverse effects ranging from moderate to major where receptors lie within close proximity to the route. The recreational and residential receptors identified as experiencing significant adverse effects are as follows:</p> <ul style="list-style-type: none"> • Footpath 301/56/20 (Buckley 56) • Footpath 410/54/10 (Buckley 54) • Footpath 414/4/10 (Northop 4) • Bridleway 414/74/10 (Flintshire 74) • Footpath 410/46 (PRow Mold 46) • Residents in dwellings at: Rose Lane; Ffordd Argoed; Llwyn Offa; Bryn-y-Baal; New Brighton; Garreg-Lwyd Farm; Plas Major Farm; Glen Brook Farm; and off the A5118.
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- 15.8.30. Human Health can be affected by construction activities, which have the potential to cause nuisance and disruption above normal levels to human receptors. This is typically as a result of air quality and dust emissions from construction activities and vehicle movements, noise generated during the Construction Stage (including through construction traffic), and from visual effects from construction activities which may impact on the typical baseline environment.
- 15.8.31. These effects are most likely to impact on inhabitants of residential dwellings (due to their proximity to the proposed construction works and construction traffic routes) and can give rise to adverse effects on human health such as sleep disturbance, annoyance, and effects on mental health for nearby residents.
- 15.8.32. As the majority of the work is due to be undertaken during the day, sleep disturbance is likely to be minimal, however it is acknowledged that small numbers of residents such as shift workers may sleep throughout the day, as well as younger children and older people (including those in care homes and hospitals).

15.8.33. The overall sensitivity of the population within the Study Area is considered to be low, as there are a few adverse baseline health indicators, with overall health considered to be generally good within the wards within the Study Area. Due to the topic considerations detailed in **Table 15-12**, the magnitude of change is identified as medium, as there is anticipated to be limited changes overall to quality-of-life for residents in the locality, users of the community assets, and WCH using PRow routes. It is acknowledged that visual impacts are anticipated to affect some residents and users of PRow, however given that a small proportion of the total local population is anticipated to be affected, the short term duration of the works, and the predominantly day time nature of the works, there is likely to be an overall temporary, short term, *Minor Adverse (Not Significant)* effect on human health.

15.9. MITIGATION AND ENHANCEMENT MEASURES

15.9.1. There are no additional mitigation or enhancement measures required or proposed for Population and Human Health, as no significant effects have been identified in **Section 15-6**.

15.9.2. The Embedded Mitigation section outlines those measures relevant to Population and Human Health which have been committed to as part of the design and delivery, of the Padeswood Spur Pipeline Proposed Development; these commitments have been presented within the outline REAC (**OEMP, Document Reference: PW.4.1**.) which accompanies this application and will be agreed with the local authority. No additional mitigation beyond those embedded mitigation measures is proposed.

15.9.3. Of relevance to Human Health, but not specifically measures implemented in relation to this Population and Human Health assessment are the following embedded mitigation measures within the **OEMP, Document Reference: PW.4.1**.

- A Dust Management Plan (DMP) will be implemented by the Construction Contractor, which may include measures to control other emissions, in addition to the dust and PM10 mitigation measures.
- Where construction is undertaken near sensitive receptors, such as residential properties and designated ecological sites (including ancient woodland), 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.
- The Construction Contractor will nominate a Community Liaison Representative (or equivalent title) who will be a nominated

competent site contact for whom the contact details will be shared with local residents and other third parties within close proximity to the construction works, and will be displayed clearly within the site compounds. The Community Liaison Representative will be responsible for engaging with any noise or vibration related matters raised by third parties.

15.10. ASSESSMENT OF LIKELY SIGNIFICANT EFFECTS

15.10.1. Given there are no mitigation and enhancement measures which will be implemented to mitigate significant adverse effects, the likely significant effects remain the same as outlined in Section 15.8, and are summarised in Section 15.12 Residual Effects.

15.11. MONITORING

15.11.1. There are no proposed monitoring arrangements for Population and Human Health.

15.12. RESIDUAL EFFECTS

15.12.1. **Table 15-13** below summarises the residual effects associated with the Padeswood Spur Pipeline Proposed Development during construction.

Table 15-13 - Summary of Residual Effects

Receptor	Pre-mitigation significance of effects	Mitigation measure	Residual effect
Construction			
Community Land and Assets	The Bonc (park) – Neutral (not significant) temporary, short term, indirect	N/A	Neutral (Not Significant) T / I / ST
	Cygnnet Delfryn House (mental health hospital) - Slight Adverse (not significant) temporary, short term, indirect	N/A	Slight Adverse (Not Significant) T / I / ST
	Lon Yr Orsaf Park; Bryn-Y-Baal Quarry; Buckley Park; Princess Avenue Playing Fields; Heol Fammau Playground; Clwyd Crescent Playground; St James Church; Village Temple Church; Northop Hall Cricket and Hockey Club; Old Padeswood Golf Club; Mold Rugby Club; New Brighton Villa FC; Mold Cricket Club; Ysgol Mynydd Isa; St David's Catholic Primary School; Speeds Pharmacy; Marleyfield House; Caffi Isa; Nant Mawr Court; New Brighton Community Centre - Neutral (not significant) temporary, short term, indirect	N/A	Neutral (not significant) T / I / ST

Receptor	Pre-mitigation significance of effects	Mitigation measure	Residual effect
Private Property and Housing	A5119 New Brighton (three properties) - Slight Adverse (not significant) temporary, short term, indirect	N/A	Slight Adverse (not significant) T / I / ST
	Alltami Road (four properties) - Slight Adverse (not significant) temporary, short term, indirect	N/A	Slight Adverse (not significant) T / I / ST
	Rose Lane (off A549) (32 properties) - Slight Adverse (not significant) temporary, short term, indirect	N/A	Slight Adverse (not significant) T / I / ST
	Rose Lane (six properties) - Slight Adverse (not significant) temporary, short term, indirect	N/A	Slight Adverse (not significant) T / I / ST
	Rose Lane (off A5118) (two properties) - Slight Adverse (not significant) temporary, short term, indirect	N/A	Slight Adverse (not significant) T / I / ST
	Padeswood Road South (eight properties) - Slight Adverse (not significant) temporary, short term, indirect	N/A	Slight Adverse (not significant) T / I / ST

Receptor	Pre-mitigation significance of effects	Mitigation measure	Residual effect
Agricultural Land Holdings	Agricultural Land Parcels 3565, 3915, and two unnamed parcels – Slight Adverse (not significant) permanent, long term, direct	N/A	Slight Adverse (Not Significant) P / D / LT
Agricultural Land Holdings Public Rights of Way	Agricultural Land Parcels 5700; 5615; 5680; 5530; 5460; 5265; 5230; 102915; 4825; 4995; 4790; 102895; 4640; 4862; 3960; 4345; 3430; 2980; 2985; 2940; 3470; 10340; 2520; 1855; 2395; 3440; 3560; 4000; 3895; 3800; 3890; 3520; 3790; 3480; 3175; 3220; 10655; 102945; 4025; 3750; and 3445 – Slight Adverse (not significant) temporary, short term, indirect	N/A	Slight Adverse (Not Significant) T / I / ST
	Footpaths 414/4/10; 414/21/30; 410/45/30; 410/47/10; 410/118/10; 410/46/40; 410/46A/10; 410/49/10; 410/52A/10; 410/50/20; 301/50/20; 301/55/10; 301/42/30; 301/43/10; 301/44/20; Wat's Dyke Way Long Distance Recreational Route; and Bridleways 414/22A/20; 410/53/20 - Slight Adverse (not significant) temporary, short term, indirect	N/A	Slight Adverse (Not Significant) T / I / ST

Receptor	Pre-mitigation significance of effects	Mitigation measure	Residual effect
	Bridleway 414/74/10; Footpaths 414/27/10; 301/46/10; 301/46/20; 301/49/10; 301/51/10; 301/50/10; 301/56/10; 301/56/20; - Neutral (not significant) temporary, short term, indirect	N/A	Neutral (Not Significant) T / I / ST
Human Health	Population within the Study Area, particularly residents, users of community assets and PRow	N/A	Minor Adverse (Not Significant) T / I / ST

Key: Direct/Indirect – D/I; Short / Medium / Long term – ST/MT/LT; Permanent/Temporary – P/T

REFERENCES

- Cheshire West and Chester . (2024). *Joint Strategic Needs Assessment (JSNA)*. Retrieved from <https://www.cheshirewestandchester.gov.uk/your-council/datasets-and-statistics/insight-and-intelligence/joint-strategic-needs-assessment-jsna>
- Cheshire West and Chester Council. (2019). *Local Plan*. Retrieved from <https://www.cheshirewestandchester.gov.uk/your-council/policies-and-performance/council-plans-policies-and-strategies/planning-policy/local-plan/local-plan-part-one>
- Department for Energy Security & Net Zero. (2023). *Overarching National Policy Statement for Energy (EN-1)*. Retrieved from <https://assets.publishing.service.gov.uk/media/65bbfbd709fe1000f637052/overarching-nps-for-energy-en1.pdf>
- Department for Energy Security & Net Zero. (2024). *National Policy Statement for Natural Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4)*. Retrieved from <https://assets.publishing.service.gov.uk/media/65a789a8867cd8000d5ae9be/nps-natural-gas-supply-infrastructure-pipelines-en4.pdf>
- DMRB. (2020). *Design Manual for Roads and Bridges*. Retrieved from LA112 Population and Human Health: <https://www.standardsforhighways.co.uk/search/1e13d6ac-755e-4d60-9735-f976bf64580a>
- Extrium. (2024). *Noise and Air Quality Viewer*. Retrieved from <http://www.extrium.co.uk/walesnoiseviewer.html>
- Flintshire and Wrexham Public Services Board. (2023). *Well-being Plan for Flintshire 2023-2028*. Retrieved from <https://www.flintshire.gov.uk/en/Resident/Council-and-Democracy/Flintshire-Public-Services-Board-Well-Being-Plan.aspx>
- Flintshire County Council. (2023). *Flintshire Local Development Plan*. Retrieved from <https://www.flintshire.gov.uk/en/Resident/Planning/Local-Development-Plan.aspx>
- Flintshire County Council. (2023). *Local Plan Interactive Proposal Map*. Retrieved from <https://flintshire.opus4.co.uk/planning/localplan/maps/flintshireproposals#/center/53.2177,-3.1601/zoom/11/baselayer/b:31/layers/annotations:0,o:9709,o:9700,o:9698,o:9694,o:9693,o:9712,o:9711,o:9710,o:9701,o:9691,o:9692,o:9704,o:9705,o:9708,o:9717,o:9699>,

- Flintshire County Council. (2023). *Public Rights of Way Map*. Retrieved from <https://rightsofway.flintshire.gov.uk/standardmap.aspx>
- Flintshire Public Services Board. (2022). *An Assessment of Wellbeing in Flintshire*. Retrieved from <https://www.flintshire.gov.uk/en/PDFFiles/Council-Democracy/Well-being-assessment-2022/An-Assessment-of-Well-being-in-Flintshire-2022.pdf>
- Future Generations Commissioner for Wales. (2015). *Well-being of Future Generations (Wales) Act 2015*. Retrieved from <https://www.futuregenerations.wales/about-us/future-generations-act/>
- IEMA. (2022). *Determining Significance For Human health In Environmental Management Assessment*. Retrieved from <https://www.iema.net/media/yljb2nbs/iema-eia-guide-to-determining-significance-for-human-health-nov-2022.pdf>
- IEMA. (2022). *Determining Significance for human health in environmental impact assessment*. Retrieved from <https://www.iema.net/resources/blog/2022/11/17/launch-of-the-eia-guidance-for-considering-impacts-on-human-health>
- IEMA. (2022). *Effective Scoping of Human Health in Environmental Impact Assessment*. Retrieved from <https://www.iema.net/media/s35fughe/iema-eia-guide-to-effective-scoping-of-human-health-nov-2022.pdf>
- Ministry of Housing, Communities and Local Government. (2023). *National Planning Policy Framework*. Retrieved from <https://www.gov.uk/government/publications/national-planning-policy-framework--2>
- NHS Public Health Wales. (2024). *Observatory - Data and Analysis*. Retrieved from <https://phw.nhs.wales/services-and-teams/observatory/data-and-analysis/>
- North Wales Regional Partnership Board. (2022). *North Wales Population Needs Assessment*. Retrieved from <https://www.northwalescollaborative.wales/north-wales-population-assessment/>
- Office for Health Improvement and Disparities . (2017). *Health and environmental impact assessment: guide local teams*. Retrieved from <https://www.gov.uk/government/publications/health-and-environmental-impact-assessment-guide-for-local-teams>
- ONS. (2021). *Population and household estimates, Wales: Census* . Retrieved from <https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/bulletins/populationandhouseholdestimateswales/census2021>

- ONS. (2023). *Census data 2021*. Retrieved from <https://www.ons.gov.uk/census>
- Standards for Highways. (2020). *Design Manual for Roads and Bridges - LA 112 Population and Human Health*. Retrieved from <https://www.standardsforhighways.co.uk/search/1e13d6ac-755e-4d60-9735-f976bf64580a>
- Stat Wales. (2023). *Stat Wales Catalogue*. Retrieved from <https://statswales.gov.wales/Catalogue>
- The European Public Health Association. (2020). *Human Health: Ensuring a high level of protection*. Retrieved from <https://eupha.org/repository/sections/HIA/Human%20Health%20Ensuring%20Protection%20Main%20and%20Appendices.pdf>
- Town and Country Planning Association, Wales Health Impact Assessment Support Unit and Public Health Wales. (2016). *Planning for Better Health and Wellbeing in Wales*. Retrieved from <https://www.iema.net/resources/blog/2022/11/17/launch-of-the-eia-guidance-for-considering-impacts-on-human-health>
- UK Government. (2000). *Countryside and Rights of Way Act 2000*. Retrieved from <https://www.legislation.gov.uk/ukpga/2000/37/contents>
- UK Government. (2010). *Equality Act 2010*. Retrieved from <https://www.legislation.gov.uk/ukpga/2010/15/contents>
- UK Government. (2011). *Localism Act 2011*. Retrieved from <https://www.legislation.gov.uk/ukpga/2011/20/contents>
- UK Government. (2014). *Open space, sports and recreation facilities, public rights of way and local green space*. Retrieved from <https://www.gov.uk/guidance/open-space-sports-and-recreation-facilities-public-rights-of-way-and-local-green-space>
- UK Government. (2017). *The Town and Country Planning (Environmental Impact Assessment) Regulations 2017*. Retrieved from <https://www.legislation.gov.uk/uksi/2017/571/regulation/4>
- UK Government. (2021). *Environmental Impact Assessment*. Retrieved from <https://www.gov.uk/guidance/environmental-impact-assessment>
- UK Government. (2022). *Healthy and Safe Communities*. Retrieved from <https://www.gov.uk/guidance/health-and-wellbeing>
- UK Government. (2024). *National Planning Policy Framework*. Retrieved from <https://www.gov.uk/guidance/national-planning-policy-framework>
- Welsh Government. (2009). *Technical advice note (TAN) 16: sport, recreation and open space*. Retrieved from Guidance: <https://www.gov.wales/technical-advice-note-tan-16-sport-recreation-and-open-space>

- Welsh Government. (2019). *Predictive Agricultural Land Classification Map 2*. Retrieved from https://datamap.gov.wales/layers/inspire-wg:wg_predictive_alc2
- Welsh Government. (2019). *Welsh Index of Multiple Deprivation (WIMD)*. Retrieved from <https://wimd.gov.wales/geography/la/W06000005?lang=en#&min=0&max=100&domain=overall>
- Welsh Government. (2021). *Ethnic Group, national identity, language and religion in Wales*. Retrieved from <https://www.gov.wales/ethnic-group-national-identity-language-and-religion-wales-census-2021-html>
- Welsh Government. (2021). *Future Wales: The National Plan 2040*. Retrieved from <https://www.gov.wales/future-wales-national-plan-2040-0>
- Welsh Government. (2023). *Adult general health and illness by local authority and health board, 2021*. Retrieved from <https://statswales.gov.wales/Catalogue/National-Survey-for-Wales/Population-Health/Adult-general-health-and-illness/generalhealthillness-by-healthboard>
- Welsh Government. (2023). *Stat Wales*. Retrieved from Population estimates by local authority, region and age: <https://statswales.gov.wales/Catalogue/Population-and-Migration/Population/Estimates/Local-Authority/populationestimates-by-localauthority-region-age>
- Welsh Government. (2024). *Planning Policy Wales - Edition 12*. Retrieved from <https://www.gov.wales/sites/default/files/publications/2024-07/planning-policy-wales-edition-12.pdf>