

22 HUMAN HEALTH

22.1 INTRODUCTION

22.1.1 This Chapter presents the assessment of the likely human health effects of the Proposed Development in terms of physical and mental health, exposure to pollution and traffic, access to recreation areas, and community well-being during construction, operation and decommissioning phases of the Proposed Development.

22.2 APPLICABLE LEGAL FRAMEWORK AND GUIDANCE

National Legislation

The Well-being of Future Generations (Wales) Act 2015

22.2.1 As mentioned in Chapter 21 Socio-economics, the Well-being Act comprises seven well-being goals including becoming “a more prosperous, resilient, healthier, more equal, and globally responsible Wales”, as well as “a Wales of cohesive communities” and “of vibrant culture and thriving Welsh Language”.

22.2.2 Of relevance for this Chapter, this legislation aims to improve health, and reduce health inequalities, through its “healthier Wales” goal. The public health goals of this Act pursue “a society in which people’s physical and mental well-being is maximised and in which choices and behaviours that benefit future health are understood”.

Public Health (Wales) Act 2017

22.2.3 The Public Health (Wales) Act 2017 aims to address a number of health concerns within Wales, while creating social conditions that are conducive to good health. This includes addressing obesity, and the use of tobacco and nicotine products, which could contribute to an increase of non-communicative diseases, typically linked to changes to income generation and change of consumption habits.

22.2.4 The Act also promotes that “Health Impact Assessments” are undertaken as a part of planning and decision making.

Mental Health (Wales) Measure 2010

22.2.5 The Act establishes public services boards (PSBs) for each local authority area in Wales. The legislation makes public bodies accountable to take action to meet objectives. This includes the following bodies:

- Welsh Ministers;

- Local authorities;
- Local health boards;
- Public Health Wales NHS Trust; and
- Velindre NHS Trust.

22.2.6 The Act aims to provide primary mental health support services, care coordination and care treatment planning, assessment of those who have used specialised mental health services, and independent mental health advocacy. The Act emphasises the importance of having access to local health infrastructure and services, and support professionals.

Policy and Strategy

Planning Policy Wales Edition 11 (2021)

22.2.7 As mentioned in Chapter 21, “Placemaking Wales” outlines the importance of nourishing the relationship between a development, and its wider setting, aiming to create public spaces that promote health, happiness, and well-being. There are six Placemaking principles: people and community, location, movement, mix of uses, public realm and identity. To align with these principles, the health and well-being of the community should be considered from the outset of developments.

22.2.8 The key Planning Principles highlight the importance of an accessible and healthy environment in ensuring communities can live, work, and play in a way that supports good physical and mental health. Facilitating this kind of environment can help tackle health inequalities, through enabling outdoor activity and recreation, and reducing exposure to pollutants.

22.2.9 This document also links to The Well-being of Future Generations (Wales) Act 2015, and presents how creating active, and social places can help reach the seven well-being goals. For example, a “Healthier Wales” can be achieved through emissions reductions, improving access to healthcare services as well as recreational and cultural services.

National Development Framework “Future Wales – the National Plan 2040”

22.2.10 This framework sets the direction of development in Wales, to 2040. It outlines where investments in infrastructure should head and sets out how planning can maximise benefits perceived by a project.

22.2.11 Some of the biggest recognised challenges and opportunities within this development framework include climate change, renewable energy, travel, and a changing society.

22.2.12 The future Wales outcome discusses a Wales where people live and work in healthy, connected, and inclusive places, where the needs of a diverse population are met. Cultural character is promoted across the Country, and health inequalities are to be tackled, through sustainable growth, including community connections, with each region building on their strengths.

Wales Infrastructure Investment Strategy 2021

22.2.13 This strategy sets out the Welsh Government's ten-year vision of the outcome of investments in infrastructure. It highlights the relationship between investment in infrastructure and well-being.

22.2.14 In line with the National well-being goals for Wales, there are four domains that run parallel to investment outcome: environmental well-being, social well-being, economic well-being, and cultural well-being.

22.2.15 Social well-being includes the protection and enhancement of both physical and mental health, safety, and well-being. This also encompasses reducing social inequalities and improving access to key public services.

Local Planning Policy

Caerphilly County Borough (CCB) Local Development Plan (LDP) (up to 2021) adopted 2010.

22.2.16 The CCB LDP identifies several objectives around health and well-being, including providing accessible green spaces, ensuring new development is accessible to walkers and cyclists, enhancing water quality, providing a range of accessible and diverse health and community facilities.

22.2.17 The LDP's proposed infrastructure for Rhymney includes a Health and Social Resource Centre set to serve the North of the Borough.

Heads of the Valleys Regeneration Area Masterplan 2020

22.2.18 The Heads of the Valleys Regeneration Area is in the northern part of Caerphilly County Borough, and comprises the Darren, Upper Rhymney and Upper Sirhowy Valleys, including the Principal Town of Bargoed and the Local Centre of Rhymney.

22.2.19 The identified low health in the area is also recognised as a barrier to reaching economic objectives, such as improving employment.

22.2.20 The role renewable energy plays in improving health is acknowledged within this Masterplan, as well as its role in promoting “clean” economic growth.

22.2.21 Integrated Well-being Networks¹ promotes a “whole system approach” to health and social care, working to support and sustain community well-being through effectively connecting and coordinating assets. The primary focus for the initial development of this initiative is Caerphilly North Neighbourhood Care Network, including of Twyn Carno, Moriah, Darren Valley, New Tredegar, Pontlottyn, Bargoed, Aberbargoed, Gilfach, St Catwg, Nelson, Ystrad Mynach, Hengoed and Maesycwmmmer.

22.2.22 Similarly, active travel² is encouraged, and its role in promoting a healthy lifestyle while increasing connectivity and accessibility is noted. This includes development of the following local areas:

- “New link from Ty Coch to existing route and the Heads of the Valleys Industrial Estate;
- New link from existing route to the primary school, town centre and leisure facilities;
- New link from existing route to Twyn Carno residential area;
- Alternative traffic free link from existing route direct to Rhymney Station; and
- Improvements to an existing link from Brynawel Primary School via recreational area to Mount Batten”.

National and UK Guidance

Health Impact Assessment (HIA) and Local Development Plans (LDPs): A Toolkit for Practice, Wales Health Impact Assessment Support Unit 2021

22.2.23 This toolkit provides guidance on how mental, physical, and social wellbeing can be put at the forefront of decision-making in impact assessment. It promotes how risk of

¹ “Place- based models of more effective collaborative, integrated working to support and sustain community well-being. In essence, this means effectively connecting and coordinating the disparate assets that contribute to well-being in a location.” In keeping with the Welsh Government’s £100m NHS Transformation Fund aimed at driving integration and its long term future vision of a whole system approach to health and social care focused on health and wellbeing, and on preventing illness”.

² Active travel covers walking and cycling routes for everyday journeys, including to school, to work to shops and to access services, such as health or leisure centres.

a Project can be minimised, and benefits can be enhanced, through analysing the direct, but also indirect and potentially difficult to identify impacts, on the general population, as well as vulnerable groups.

Institute of Environmental Management and Assessment (IEMA) Guide to: Effective Scoping of Human Health in Environmental Impact Assessment (2022) and Determining significance For Human Health in Environmental Impact Assessment (2022)

- 22.2.24 This guidance provides a framework in which health should be considered as part of an environmental impact assessment (EIA). It considers several topics, including the presentation of health in an EIA, identifying stakeholders through engagement, scoping wider determinants of health, as well as analysis of methods and sources of data. A framework for determination of significance is also provided, in relation to effective impact assessment.
- 22.2.25 This framework allows accurate identification of relevant health issues, which have the potential to impact populations. In addition to this, it suggests, the identification of vulnerable populations is a necessary process of health impact assessment, to isolate any health inequalities.
- 22.2.26 The applicable EIA legislation, mentioned in Chapter 21 and covered in detail in Chapter 2, is also considered withing this chapter.

22.3 STUDY AREA

Project and Site Information

- 22.3.1 The Project description is presented in Chapter 5 and in Chapter 21 in terms of socio-economic aspects. In summary, the Proposed Development is located in 28 Ha of greenfield land, comprise three wind turbines with a generating capacity of around 5MW each and a maximum tip height of 150m, alongside around 5MW ground mounted solar PV arrays to generate approximately 20MW of energy.
- 22.3.2 For the purpose of this assessment, it is expected that turbine components will be transported to site from the port of Swansea, via the A465 and A469 and the Industrial Estate access road to the project location. It is likely that new tracks will be required within the Site, in order to access the turbines. In addition, a 2.4m high fence will be installed inside the development boundary to increase security.

22.3.3 Twenty five full time equivalent (FTE) jobs are expected on site during construction and approximately 30 FTE jobs are expected on Site during construction of the wind turbines are expected to be approximately 30 people. General maintenance will be undertaken annually with teams of two people with two-day service schedule.

Administrative division

22.3.4 Land use and administrative divisions in Rhymney are presented in Chapter 21. For the purpose of this Chapter, the Rhymney area includes the town of Rhymney, Pontlottyn, Abertysswg, Butetown and Twyncarno. Rhymney is located in the northernmost tip of CCB, (see Chapter 21) and is adjacent to the County Boroughs of Merthyr Tydfil to the west, Blaenau Gwent to the east, and Powys to the north.

Health Area of Influence

22.3.5 The health Area of Influence (AoI) is aligned to the socio-economic AoI (presented in Chapter 21). In terms of health, the Direct AoI relates to the area in which direct effects from human health impacts are expected, including the most immediate localities (cities, towns, households) that are linked through wider determinants of health that have institutional, social or cultural interactions to the Site.

22.3.6 As discussed in Chapter 21, the Direct AoI is predominantly comprised of residential buildings around the Site. The closest properties to the Site include the residential property of the Site Landowner which is approximately 190m north of the Site, alongside four other residential properties located 165m, 540m, 640m and 650m northeast of the Site. In addition, residential properties of Rhymney and Bute town range from 450-650m north of the Site boundary. Alongside this, there are local leisure and recreation facilities and healthcare facilities within Direct AoI.

22.3.7 As established in Chapter 21, the Indirect AoI relates to the adjacent area where indirect and other cumulative effects from socio-economic impacts are expected. Alongside this, there are local leisure and recreation facilities and healthcare facilities.

22.4 BASELINE CONDITIONS

General population health

22.4.1 As described in Chapter 21, and according to the 2021 Census of Wales, Rhymney has a population of 8,543 people with approximately 3,900 households.

22.4.2 According to the 2021 Census of Wales, fair health in Rhymney is above county and national average, while rates of very good health and good health are lower than average, and rates of bad health and very bad health are higher in Rhymney, comparatively (see Figure 22.1).

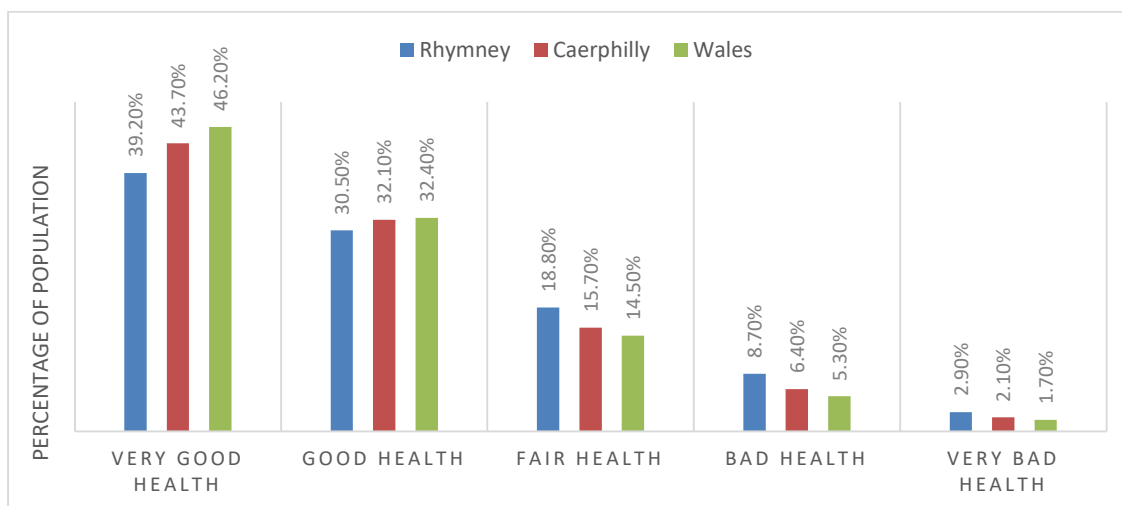


Figure 22.1: General Health levels of Rhymney, in relation to its County Caerphilly, and wider Country (Wales) (Census, 2021).

Disability and Care

22.4.3 According to the 2021 Census, the proportion of population with disabilities³ is higher in Rhymney (27.8%), when compared to wider Wales (21.6%). Similarly, these heightened rates can be seen within Caerphilly (23.6%) and in neighbouring Counties: Merthyr Tydfil (23.8%) and Blaenau Gwent (24.9%).

22.4.4 Accordingly, the percentage of the population in Rhymney that provide no unpaid care or provide 19 hours or less unpaid care a week, are both lower than national rates. Meanwhile, the percentage of the population providing between 20 and 49 hours a week is higher (3.3%, compared to national average of 2.2%), alongside the population providing of 50 or more hours a week (5.2% in Rhymney, compared to 3.6% nationally). This could suggest strained levels of care services offer in the AoI.

22.4.5 In addition, the identification of deprivation (more below) and disability provide information on potential vulnerable groups within the AoI. This helps provide tailored mitigation measures to social receptors of the Proposed Development.

³ As defined in the Equality Act 2010, known as the Public Sector Equality Duty (PSED) in Wales.

National Health Indicators and Deprivation

22.4.6 The Welsh Index of Multiple Deprivation (WIMD) Results Report identifies health indicators as a measure of good health, which provide an insight into any health inequalities within the area, which further help identify potential vulnerable groups.

22.4.7 The first of seven indicators is General Practitioner (GP)-recorded chronic conditions, which accounts for asthma, hypertension, coronary heart disease, chronic obstructive pulmonary disease, diabetes, epilepsy, and heart failure. Rhymney sees higher percentages of these chronic conditions, when compared the County and National record (see Figure 22.2).

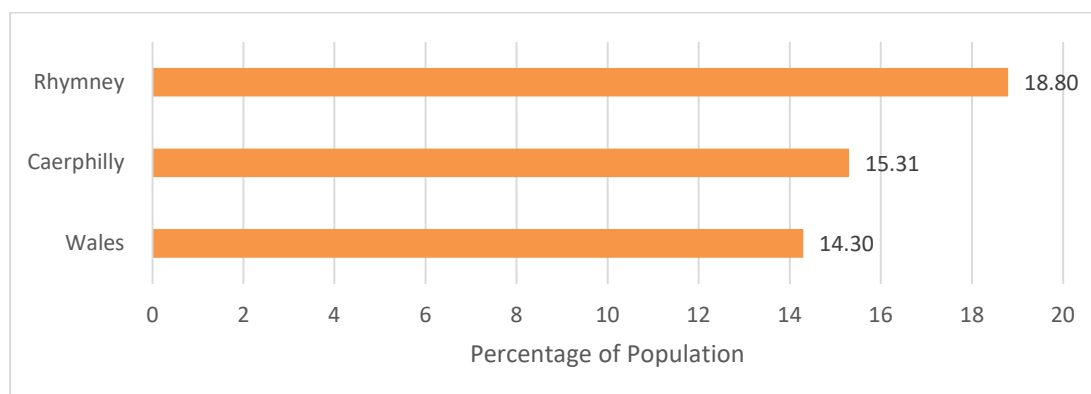


Figure 22.2: The rate of reported chronic conditions in Rhymney (GP-recorded chronic condition, rate per 100) (LSOA's "Twyn Carno 1", "Moriah 2" and "Moriah 3"), Caerphilly and Wales (Census, 2021).

22.4.8 Limiting long-term illness⁴, the second WIMD health indicator of good health, presents similarly high levels of these long-term limiting illness in Rhymney, when compared to wider County and Country (see Figure 22.3).

⁴ According to the Welsh Index of Multiple Deprivation includes chronic obstructive pulmonary disease, heart failure, diabetes, inflammatory bowel disorders, musculoskeletal conditions, alcohol, and other addictions, as well as many others.

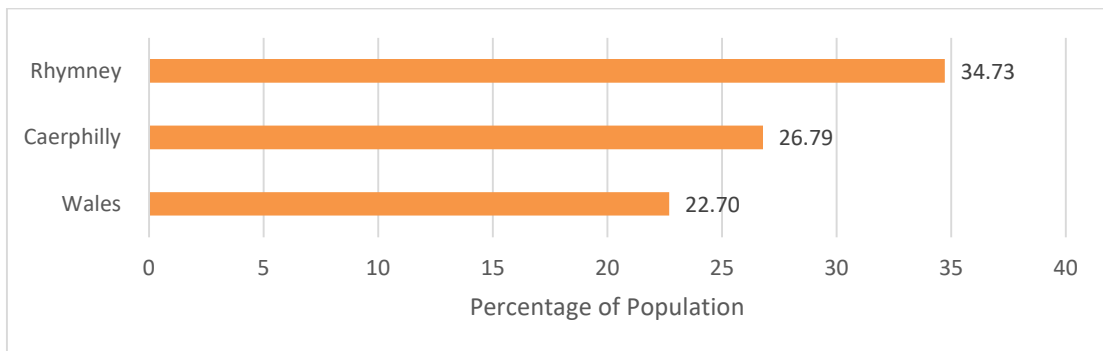


Figure 22.3: The rate of reported limiting long-term illness in Rhymney, rate per 100 (LSOA’s “Twyn Carno 1”, “Moriah 2” and “Moriah 3”), Caerphilly and Wales (Census, 2021).

22.4.9 Premature deaths and low birth weight (live single births less than 2.5kg) are further indicators of good health, that also see similar increased levels in Rhymney, when compared to County and Country levels (see Figure 22.4 and Figure 22.5).

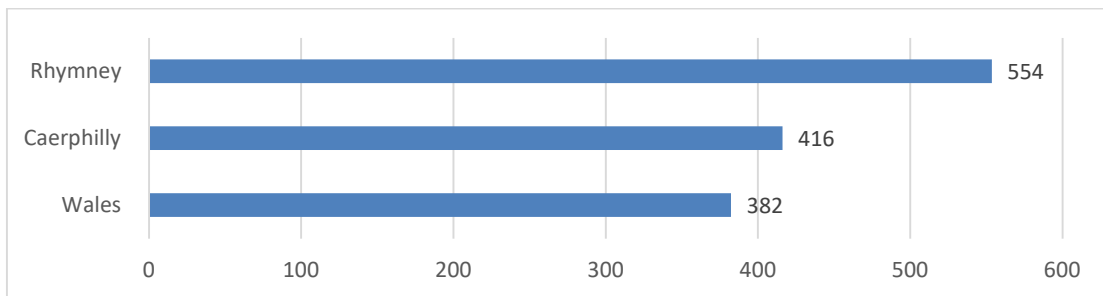


Figure 22.4: The rate of premature death in Rhymney, rate per 100,000 (LSOA’s “Twyn Carno 1”, “Moriah 2” and “Moriah 3”), Caerphilly and Wales (Census, 2021).

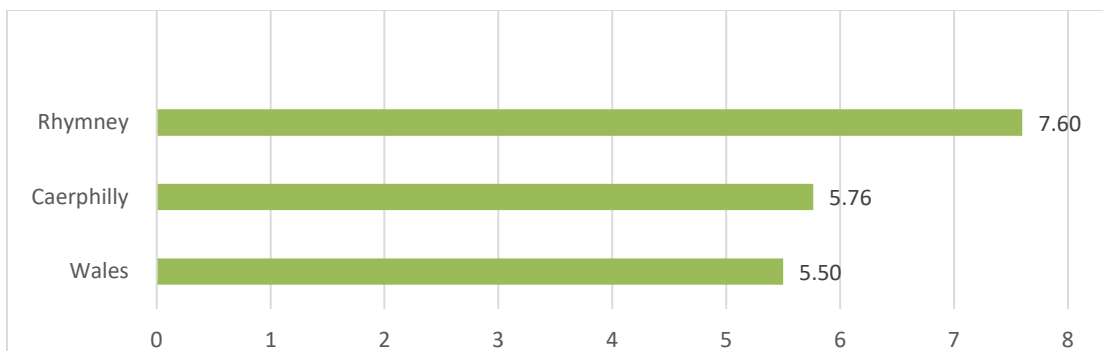


Figure 22.5 The rate low birth rate, rate per 100 (live single births less than 2.5kgs) in Rhymney (LSOA’s “Twyn Carno 1”, “Moriah 2” and “Moriah 3”), Caerphilly and Wales (Census, 2021).

22.4.10 GP-recorded mental health conditions further indicate levels of health, with levels in Rhymney again exceeding National and County Rates (see Figure 22.6).

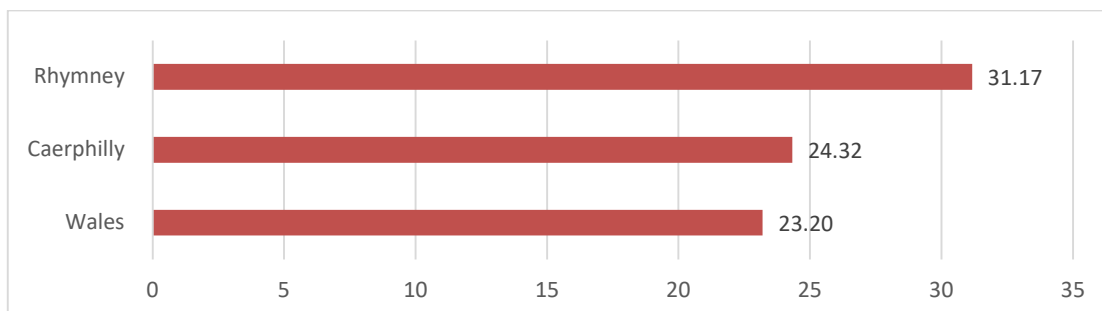


Figure 22.6: The rate of reported mental health condition in Rhymney, rate per 100 (LSOA's "Twyn Carno 1", "Moriah 2" and "Moriah 3"), Caerphilly and Wales (Census, 2021).

22.4.11 Cancer incidence also gives an indication of health, showing higher rate of incidence in Rhymney (see Figure 22.7).

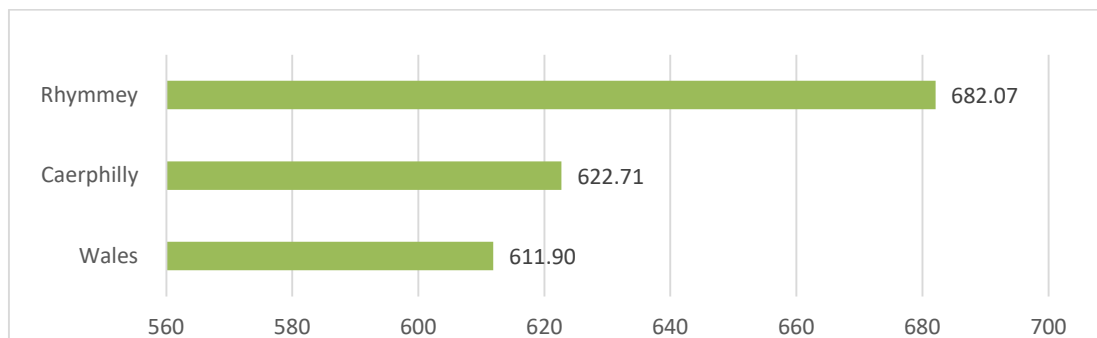


Figure 22.7 The rate of reported cancer incidents in Rhymney, rate per 100,000 (LSOA's "Twyn Carno 1", "Moriah 2" and "Moriah 3"), Caerphilly and Wales (Census, 2021).

22.4.12 The last WIMD indicator of good health is demonstrating a low number of children aged 4-5 who are obese. In Caerphilly, this is as high as 13%, above the National average of 11.8%. There is no current data to analyse child obesity in Rhymney.

22.4.13 As mentioned in Chapter 21, and according to the 2021 Census, Rhymney has high rates of household deprivation, with 66.5% of households deprived in one or more dimension⁵, compared to the national average of 54.1%.

22.4.14 The WIMD from 2019 identifies significant levels of deprivation in Caerphilly County, with 62.7% of its Lower Layer Super Output Area (LSOA) in the top 50% most deprived category. Neighbouring Blaenau Gwent has the highest proportion at 85.1%, followed by Merthyr Tydfil at 77.8%. Caerphilly is home to four LSOAs of deep-rooted

⁵ The Welsh Index of Multiple Deprivation, based on Census 2021 data classifies households in England and Wales by four dimensions of deprivation: employment, education, health and disability and household overcrowding.

deprivation⁶. Three of them are located in the Aol: Twyn Carno 1, located in the Direct Aol, and Tredegar Central and West 2 located within the Indirect Aol.

22.4.15 The Caerphilly County Borough Local Area Well-being Assessment (2022) highlights Twyn Carno, as it lies within the 10% most deprived in terms of Income, Health, and Community Safety.

Healthcare facilities

22.4.16 According to the 2021 Census, the following general practice facilities lie within the Aol:

- Meddygfa Cwm Rhymney Practice within Rhymney Integrated Health Social Care Centre (Direct Aol);
- Tredegar Health Centre; Glan Yr Afon Surgery (Indirect Aol);
- Dowlais Medical Practice (Indirect Aol); and
- Morlais Medical Practice (Indirect Aol).

22.4.17 The nearest Hospital with an Emergency Department is located within the Indirect Aol, named Prince Charles Hospital. The route to which from the Site, is highlighted in Figure 22.8.

⁶ Those that have remained within the top fifty most deprived, small areas in Wales for the last five publications of The Welsh Index of Multiple Deprivation ranks, based on Census 2021.

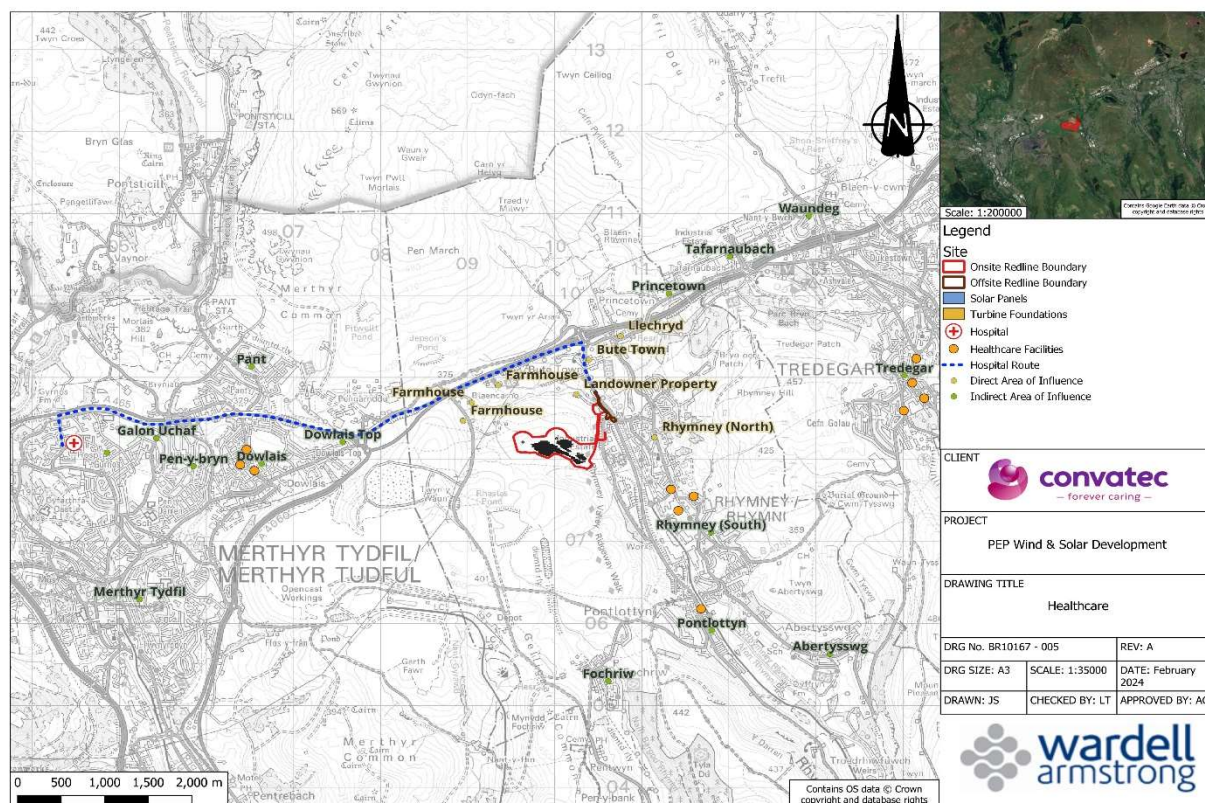


Figure 22.8: Healthcare facilities⁷, and route from Site to the closest hospital within the Direct, and Indirect Aol.

Public Right of Way and Green Space

22.4.18 As described in Chapter 21, there are several public rights of way (PRoWs) running through the Site. These include RHYM/FP90/2, RHYM/FP95/6, RHYM/FP91/1, as well as a National Trail route and bridleway (RHYM/BR93/1/ RHYM/BR92/1) (see Figure 22.9). However, consultation has shown these paths are joint and run within a cul-de-sac route and only enters the Site by approximately 50 metres. There are also bridleways to the North of the Site (see Figure Figure 22.9), which will also be considered within the Aol.

⁷ While Hospitals are clearly marked individually on the map, the other “healthcare facilities” include GPs, pharmacies, sexual and reproductive health facilities, dentists, hospitals without emergency departments.

22.4.19 In a wider radius, Rhymney Valley Cycle route, (route 468 of the National Cycle Network) runs through Rhymney, from Pengam north (just south of Gilfach) towards New Tredegar, with it partly bordering Site (see Figure 22.9).

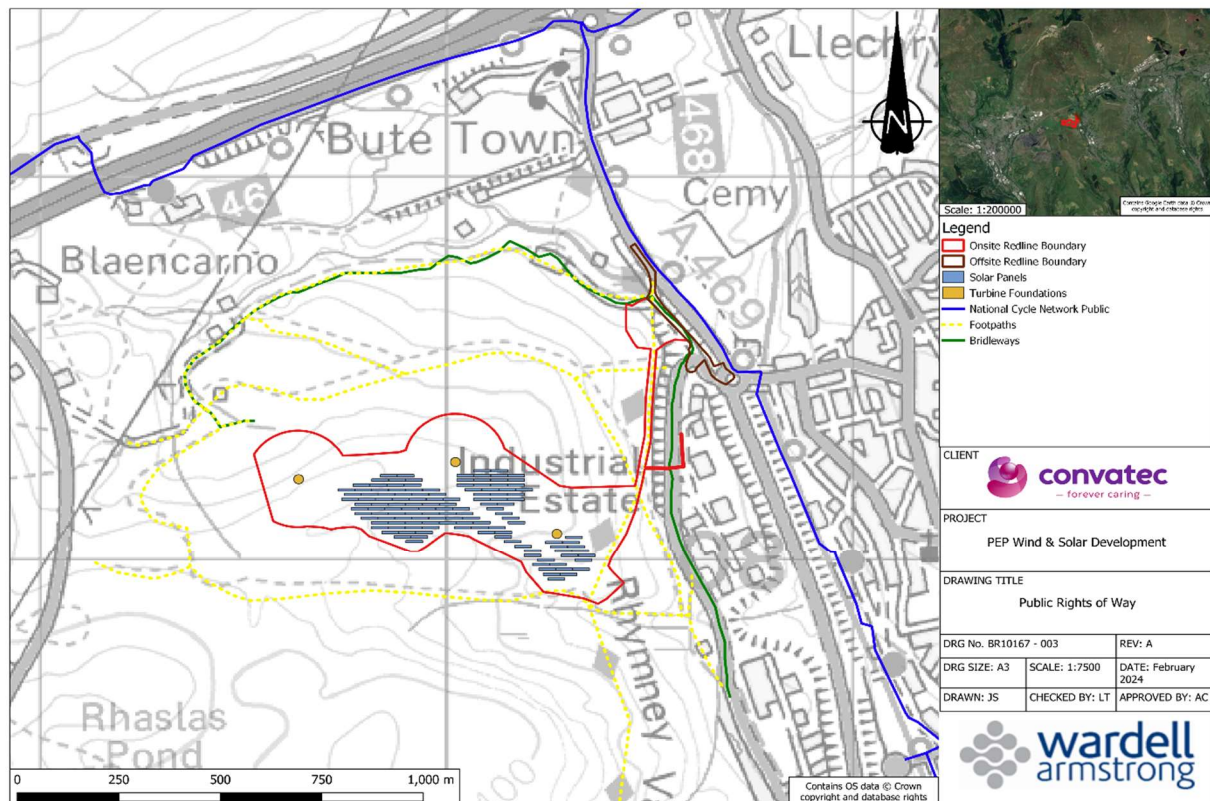


Figure 22.9: The Public Right of Way, including National Cycle Routes, footpaths and bridleways around the Site.

22.5 ASSESSMENT METHODOLOGY

General Methodology

22.5.1 As described in Chapter 21, impact significance will be determined through the interrelation between social receptor sensitivity and impact magnitude (see Table 5.1 and Table 5.2 in Chapter 21) in two steps: before and after the implementation of mitigation measures, resulting in pre-mitigation significance and post-mitigation significance. An impact that is assessed as moderate or above is considered to be “Significant” (in EIA terms).

22.5.2 Pre-mitigation assessment considers embedded mitigation measures per project stage and post-mitigation assessment will consider additional mitigation measures for

adverse impacts and enhancement measures for beneficial impacts. The post-mitigation evaluation will result in a residual impact significance. Receptor sensitivity, magnitude components and degrees, and significance criteria are presented in Chapter 21.

22.6 EVALUATION ASSUMPTIONS

Design Assumptions

22.6.1 The following design assumptions have been made, in assessing the health impacts of the Proposed Development:

- It is assumed that no residential properties will require acquisition for the development of the Site and the selected cable route will be chosen to make sure this is the case;
- It is assumed PROWs within Site boundary will most likely be accessible during Operations;
- The lifespan of the Proposed Development has been assumed to be 25 years; and
- An assumption has been made that other Chapters have fully assessed the environmental impact of the Proposed Development, regarding their primary focus (e.g., noise, traffic).

Embedded Mitigation

22.6.2 Embedded mitigation measures relevant to receptors includes those described in Chapter 12, Traffic. Similar to Chapter 21, this Chapter assumes that construction traffic will follow a Construction Traffic Management Plan (CTMP), which will form part of the Construction Environmental Management Plan (CEMP). The CTMP will provide for the majority of contractor staff to arrive at the Site by minibus. Car trips will be minimised to reduce traffic and environmental effects of the Proposed Development. The CTMP will also include an Abnormal Loads Delivery Management Plan (ALDMP), setting out all traffic management and mitigation measures required for safe and efficient transport of these loads. It is assumed that the DMP process will ensure any effects on local communities and road users are minimal.

Study Limitations

22.6.3 This study aims to assess impacts on health based on the most recent data and robust information. Nonetheless, some study limitations have been identified, undermining a precise assessment of effects on social receptors, these are:

- Accuracy of ONS 2021 data was affected by the Covid-19 pandemic;
- Noise and Air Quality Impact Assessments for the Proposed Development were not available at the time of writing this chapter; and
- Lack of final design decision on whether footpaths within Site boundary would be open to public during operations and whether cabling to Convatec to the east of the Site would be underground.

22.6.4 If the information listed above was not available when assessing impacts on human health, a conservative approach was taken.

Receptors

22.6.5 Identified receptors, alongside their sensitivity in relation to the Proposed Development, are outlined in Table 22.1 Table 22.1: Social receptor sensitivity summary, below:

Table 22.1: Social receptor sensitivity summary		
Receptor	Description and sensitivity analysis	Sensitivity
Local residents within the Direct AoI	People in the Direct AoI have limited transport connections, limited employment opportunity, high levels of deprivation, and limited resources to adapt to change without the assistance of external assistance.	Medium
Local residents within the Indirect AoI	People in the AoI also have limited transport connections, limited employment opportunity, and high levels of deprivation. However, they have greater connections and links to bigger towns and mobility options for livelihood activities, than the residents of Rhymney.	Low
Local Workforce within the Direct AoI	The Economically Active Population (EAP) has limited job opportunities within Rhymney, due to restricted presence of labour sectors, which partly contributes to deprivation levels in the area, in addition to the limited public transport links to other local areas.	Medium
Local Workforce within the Indirect AoI	The EAP in the Indirect AoI have higher levels of infrastructure connectivity in terms of road access to other towns and more diverse labour sectors and are therefore more able to adapt to change in labour opportunities. Change in employment may take less time, with some degree of re-skilling.	Low
Businesses within the AoI	Businesses in both the Direct and Indirect AoI have access to resources that the general population may not, meaning they are more adaptable to change. In addition, there is the option to improve its conditions through the will of the business.	Low
Road users within the AoI	Road users in both the Direct and Indirect AoI have limited alternatives if one road is blocked/damaged and added or extended time to re-route in case of affectations. Public health and safety risks will be critical to the use of local roads. Limited opportunity to adapt to change.	Medium

Users of local PRoWs (footpaths, bridleways, cycle paths)	Access to PRoW is expected to remain open throughout development. However, cyclist and users of footpaths have limited alternative access to outdoor spaces in Rhymney, as well as limited transport routes within the Aol to reach other open spaces.	Medium
Site workers	Although in close proximity to construction impacts from soil disturbance and pollution pathways, there is presumed embedded mitigation measures put in place to prevent impact on this receptor. Skilled workers within one of Wales's highest employing industries suggests receptor is able to adapt to change.	Low
Landowner	The Site owner has entered voluntary negotiations to host the Proposed Development and it is likely that the resources from providing access and use of the land will provide capacity to adapt to change.	Low
Vulnerable groups	People in vulnerable groups such as elderly adults, children, and minority groups have more difficulties to adapt to change. This vulnerability is amplified by high levels of existing deprivation, including household, economic and educational limitations, suggesting difficult to access resources and services, as well as limited presence from support networks.	High

22.7 IMPACT ASSESSMENT

Construction Impacts

Reduced use of PRoW routes for recreation

- 22.7.1 There is potential for conflicting manoeuvres between people and development-related traffic, which includes HGVs and some abnormally large HGVs. Chapter 14 – Transport assessed impact on PRoW users to be moderate adverse after embedded mitigation and assessed that people using PRoWs could experience delay, fear, and intimidation during construction. Real or perceived increased traffic and presence of HGVs can reduce the use of cycling routes and bridleways in the Aol.
- 22.7.2 Restricted access to green space and leisure areas may occur throughout construction for the Health and Safety (H&S) of local residents, which will likely block footpaths (PRoW) within and adjacent to the Site of the Proposed Development. Some PRoWs within the Site of the Proposed Development will likely be inaccessible during construction, especially the National Trail route bridleway BR/93/3, located along the access track of the Proposed Development. Even if the design of the Proposed Development does not envision blocking PRoWs, it is assumed that H&S buffer areas could impact these PRoWs and reduce the use of these routes to access recreation.
- 22.7.3 Users of PRoW have a medium sensitivity. This impact is expected to be short-term, reversible, local, adverse, with medium intensity, resulting in low magnitude and **minor significance**. Although there is no need for additional mitigation measures, some recommended mitigations are presented below. This impact is **not significant**.

Increased use of local services and facilities

22.7.4 Influx of construction workers and increased supply chain activities can cause strain on local services, including healthcare services, food supply and housing/accommodation services in the Direct and Indirect AoI. With higher demand for food, accommodation, and local services, including healthcare, residents within the AoI are more likely to experience difficulty in accessing these provisions and services. On the other hand, businesses in the area, such as hotels, restaurants and local shops can see this impact as beneficial in socio-economic terms, thanks to increased local spending from workers and general employees of the Proposed Development.

22.7.5 Residents in the Direct AoI have a medium sensitivity, while residents in the Indirect AoI and local businesses have a low sensitivity. This impact is expected to be short-term, reversible, local, adverse, with low intensity for residents and medium intensity for businesses, still resulting in low impact magnitude for these receptors. This impact has **minor adverse significance** for local residents and a **minor beneficial significance** for businesses. Without mitigation measures or enhancement measures, these impacts are **not significant**.

Increased exposure to traffic incidents

22.7.6 Throughout construction, it is likely that the increased levels of traffic will result in increased exposure of local road users to traffic-related risks from construction vehicles and employee vehicles. Road users within the AoI have a medium sensitivity. The impact is expected to be short-term, reversible, regional in extent, with low intensity, resulting in low magnitude and **minor significance**. Without the need for additional mitigation measures, this impact is **not significant**.

Annoyance related to the presence of the Proposed Development

22.7.7 The beneficial impact on local businesses and creation of jobs in the area (assessed in Chapter 21 – Socioeconomics) can have a beneficial effect on the general well-being of the local population. Even though employment opportunities are limited, and this impact in Chapter 21 was assessed as minor beneficial, the local residents' medium sensitivity means that even limited beneficial changes can have a significant effect on the well-being of local population with the appropriate enhancement measures (see Local Employment Plan and Community Development Plan description in Chapter 21).

22.7.8 However, real or perceived effects from noise and air quality impacts, increased traffic, reduction of access to green spaces, or changes in the sense of place can potentially reduce the general well-being of local residents. Whilst a clear association between health effects and wind turbine related sound levels has not been confirmed (van Kamp, 2021), negative perception of the planning and development process of wind farms can increase annoyance which in turn can exacerbate health conditions.

22.7.9 In the context of the Proposed Development, the closest residential building is the Site landowner's property located 190m north of the Site, followed by farmhouses and residential buildings in Rhymney and residential properties of Bute town ranging from 450-650m east and north of the Site. Initial stakeholder engagement activities identified that noise was a general concern of local stakeholders. If left unmanaged, this annoyance could grow to form negative perceptions of the Proposed Development and potentially reduce well-being levels.

22.7.10 The receptors, local residents within the Direct and the Site landowner, are of medium and low sensitivity respectively. This impact is expected to be short-term during construction, reversible, local, adverse, with medium intensity for the Direct Aol and low intensity for the landowner, resulting in a medium magnitude and low magnitude for residents of the Direct and the landowner, respectively. This impact has a **moderate adverse significance** for residents of the Direct Aol, and a **minor adverse significance** for the Site landowner. Without mitigation measures, this is a **significant impact** for local residents of the Direct Aol.

Operational Impacts

Reduced use of PRow routes for recreation

22.7.11 Security fencing is expected to be placed around the solar panels and wind turbines on Site. Although PRowS are expected to remain accessible through the operation of the Proposed Development, the presence of fencing may alter or deviate their existing paths. The visual impact of the Proposed Development is assessed in detail in Chapter 7.

22.7.12 Users of PRowS have a medium sensitivity. This impact is expected to be long term throughout the operation stage, reversible, local, adverse, with low intensity due to the previous change from the construction stage, resulting in low magnitude.

However, given the long-term extent of this impact, it is expected to result in **moderate significance**. Without mitigation measures, this impact is **significant**.

Annoyance related to the presence of the Proposed Development

22.7.13 As elaborated within the construction phase, while studies have not found a direct correlation between wind turbine noise and human health impacts, real or perceived noise and air quality impacts, increased traffic, reduction of access to green spaces, or changes in the sense of place can potentially reduce the well-being of local residents. Whilst noise levels from construction activities would decrease, operation noise levels could increase levels of annoyance if left unmanaged.

22.7.14 The receptors, local residents within the Direct and the Site landowner, are of medium and low sensitivity respectively. This impact is expected to be long-term throughout operation, reversible, local, adverse, with medium intensity for the Direct AoI and low intensity for the landowner, resulting in a medium magnitude and low magnitude for residents of the Direct and the landowner, respectively. This impact has a **moderate adverse significance** for residents of the Direct AoI, and a **minor adverse significance** for the Site landowner. Without mitigation measures, this is a **significant impact** for local residents of the Direct AoI.

Decommissioning Impacts

Reduced use of PRow routes for recreation

22.7.15 Decommissioning traffic can restrict access and make the use of PRowS less pleasant because of noise and general reduced feeling of safety. Restricted access to green space may occur throughout decommissioning for the H&S of local residents and there will likely be restricted access to PRowS within the Site.

22.7.16 There will be some visual impact from decommissioning on PRow users, further reducing attractiveness of footpaths and green spaces adjacent to the Site. Moreover, increased exposure to noise from decommissioning work can also reduce attractiveness of leisure activities around the Site. This is particularly important as noise concerns were recorded during initial Stakeholder Engagement for the Proposed Development. More detail on noise impacts can be found in Chapter 8.

22.7.17 Users of PRowS have a medium sensitivity. This impact is expected to be short term similar to the construction stage, reversible, local, adverse, with medium intensity due

to the manoeuvring required to transport the dismantled equipment, yet still resulting in low magnitude, and **minor significance**. This impact is **not significant**.

Increased use of local services and facilities

22.7.18 Influx of workers during decommissioning could cause similar strains on local services for local residents of the Direct AoI and the Indirect AoI as described above. Businesses in the area could benefit from this impact beneficial, thanks to increased local spending from workers and general employees during decommissioning.

22.7.19 Residents in the Direct AoI have a medium sensitivity, while residents in the Indirect AoI and local businesses have a low sensitivity. This impact is expected to be short-term during decommissioning, reversible, local, adverse, with low intensity for residents and medium intensity for businesses, nonetheless resulting in low impact magnitude for receptors. This impact has **minor adverse significance** for local residents and a **minor beneficial significance** for businesses. Without mitigation measures or enhancement measures, these impacts are **not significant**.

Increased exposure to traffic incidents

22.7.20 Throughout decommissioning, it is likely that the increased levels of traffic will result in increased exposure of local road users to unsafe road conditions from decommissioning vehicles and employee vehicles. Road users within the AoI have a medium sensitivity. The impact is expected to be short-term, reversible, regional in extent, with low intensity, resulting in low magnitude and **minor significance**. Without the need for additional mitigation measures, this impact is **not significant**.

22.8 MITIGATION MEASURES

Mitigation and Enhancement

22.8.1 The following measures aim to reduce the magnitude of adverse impacts and enhance the magnitude of beneficial impacts, where possible. The following measures are linked to the significant impacts assessed above.

Measures to prevent the reduction of use of Public rights of way

22.8.2 Whilst disruptions to PRoWs are prevented to the extent possible in the Proposed Development design, the potential restriction throughout operation will require additional measures to maintain access and provide diverse mobility options for the users of local PRoWs. These measures are not typically included in the **Traffic**

Management Plan (TMP) but can be added as an extension to PRowS and the help of the **Stakeholder Engagement Plan (SEP)**, further detailed below.

22.8.3 The TMP should prioritise access to PRowS whenever possible, in agreement with the landowner and as long as safe and secure passage is feasible. In addition, alternative routes can be decided through stakeholder engagement to identify different mobility options for users of local PRowS, specifically addressing the need to access recreation areas. Within the construction and decommissioning period, there should be a member of the team diverting users of PRow to these alternate routes and making sure that users of local PRowS are not exposed to community H&S risks. Diversions of PRowS will also be advertised to the public in advance of construction starting.

22.8.4 In addition, the consultee response from Planning and Environment Decisions Wales (PEDW) and their suggested mitigation measures should be followed (see Chapter 21).

Measures to increase a targeted and more equitable use of local services

22.8.5 Due to the limited number of jobs and development-related influx, the potential stress on local services was evaluated as having minor adverse significance for local residents of the Aol with no need for mitigation measures. However, there is an opportunity to implement enhancement measures to help increase the beneficial effect that an increased use of local services could have on local businesses. The implementation of a **Local Employment Plan (LEP)**, also described in Chapter 21) could increase a targeted and more equitable use of local services.

22.8.6 Part of the objective of the LEP is to guide the procurement process to maximise the use of local supply chain and support local businesses. Whilst the LEP primarily focuses on upskilling local workforce to benefit from the positive economic impacts from the Proposed Development, it can also develop collaboration programmes with local businesses and support starting enterprises or community-led business initiatives, especially in more deprived areas. With tackling socio-economic inequalities has an indirect effect on addressing health inequalities, the LEP can pave the way for more targeted and more equitable use of local health-related services and facilities.

22.8.7 The LEP should include a special section on health services within its analysis of local capacity skill gap and training requirements. Once developed, this analysis can be shared with the local Health Board to support existing or create new upskilling programmes for health and care service provision in the Direct Aol. Improving

healthcare services via training programmes for health practitioners should target the priority areas set by the CCB LDP. These include the Caerphilly North Neighbourhood Care Network, including Twyn Carno within the Direct Aol.

22.8.8 Another example of how the LEP could help reduce health inequalities in the Direct Aol is by extending its upskilling and training programmes to go beyond the required construction activities for the Proposed Development and include cross-sectoral application of construction skills. With certified training, the upskilled Economically Active Population (EAP) of the Direct Aol could then contribute to the objectives of the CCB LDP to increase health and community facilities in Rhymney. A clear example of this in the LDP is the proposed construction of a Health and Social Resource Centre for Rhymney with the objective to serve the North of the Borough.

22.8.9 In alignment with the TMP, key pathways to emergency facilities will be maintained, including the hospital. In addition, key social infrastructure would remain accessible for well-being purposes, through the identification and prevention of obstruction of main roads, sensitive crossings, and pathways.

22.8.10 As described in Chapter 21, a **Community Development Plan (CPD)** or, developing a **Social Value Strategy** for the Aol would enhance the retainment of local benefits, including tackling health inequalities. Linked to the expected community fund of approximately £75,000 per year, the CPD could guide this community fund to target key areas in terms of health priorities. For instance, the promotion of outdoor activities by increasing access to recreation areas would be aligned with the TMP and measures mentioned above. The CCB LDP prioritises active travel as part of a healthy lifestyle, which can be supported by connectivity in key local areas, such as building links from primary schools to the Rhymney town centre and leisure facilities, as well as extending links to Twyn Carno.

22.8.11 Additional enhancement measures concerning local residents (regarding employment, energy security and support for education) are described in Chapter 21 – Socioeconomics.

Measures to manage expectations and annoyance related to the Proposed Development

22.8.12 Developing and implementing a **Stakeholder Engagement Plan (SEP)**, described in Chapter 21, can help maintain open and timely disclosure of the Proposed

Development process to local stakeholders and help reduce potential stress and anxiety by managing expectations on potential impacts and their respective mitigation and enhancement measures. The SEP will collect stakeholder feedback and address potential concerns, generating more inclusive means for local residents and groups to participate in the planning and development process of the Proposed Development. It can inform the management plans such as the TMP, CDP and LEP on local residents' priorities.

- 22.8.13 A Grievance Mechanism should be developed as part of the SEP, creating an opportunity for stakeholders to share grievances. In terms of health, this mechanism is crucial for community well-being, since residents will have a space to share their potential worries and have a clear process to obtain a response. This could reduce stress related to perceived changes triggered by the Proposed Development and have a beneficial effect for local well-being.

Vulnerable Groups

- 22.8.14 Vulnerable groups include marginalized and particularly deprived individuals lacking resources to adapt to change, including, people with disabilities and long-term health conditions, those with mobility issues, minority groups, elderly adults, children, and single-parent households.
- 22.8.15 Vulnerable groups may be disproportionately impacted by adverse effects from the Proposed Development, and specific measures should be put in place to make sure these groups have access to its benefits. These could include:
- Identifying vulnerable individuals and groups within stakeholder engagement activities and implementation of the SEP, making sure that their priorities of development are taken into consideration in other plans such as the CDP and LEP;
 - Extending the LEP focus to identify the upskilling and training needs for carers and health service providers in areas of significant deprivation and collaborate with the Local Health Board to support that training as one of the goals of the LEP; and
 - Considering vulnerable groups as a priority when developing the proposed CDP.

22.9 RESIDUAL IMPACTS

Post-mitigation and post-enhancement significance

22.9.1 Considering the abovementioned mitigation and enhancement measures, the magnitude of certain impacts may be changed in terms of the duration, spatial extent and / or intensity. The measures aim to reduce adverse magnitude and increase beneficial magnitude of specific impacts. Only the following significant adverse impacts and non-significant beneficial impacts are evaluated post-mitigation:

Restricted mobility options for PRowS

22.9.2 Through the operation phase, once the Traffic Management Plan (TMP) and Stakeholder Engagement Plan (SEP) have been implemented, it is expected that there will be a decrease in the intensity and magnitude of the impact, resulting in a post-mitigation **minor adverse significance**.

Increased use of local services

22.9.3 With the implementation of the Local Employment Plan (LEP) and Community Development Plan (CDP), supported by the SEP, the intensity of this impact is expected to increase in the construction phase, increasing its magnitude from low to medium, resulting in a post-enhancement **moderate beneficial significance**.

Annoyance related to the presence of the Proposed Development

22.9.4 Managing expectations, addressing potential annoyances and understanding potentially negative perceptions of local residents about the Proposed Development can be achieved through the implementation of the SEP and CDP. If applied properly, the mitigation measures in each management plan can help reduce the intensity and magnitude of this impact from medium to low, resulting in a post-mitigation **minor adverse significance**.

Summary of Impacts

22.9.5 To summarise, the impacts the Proposed Development will have on human health, including the pre-mitigation and po-mitigation assessment, can be seen in **Table 22.2**, below.

Table 22.2: A summary of the impacts of the Proposed Development on human health

Impact	Project Phase	Receptors	Pre-mitigation assessment								Post-mitigation assessment		
			Receptor sensitivity	Adverse/beneficial	Duration	Reversibility	Spatial Extent	Intensity	Impact Magnitude	Impact Significance	Mitigation applied	Residual magnitude	Residual Significance
Reduced use of PRoW routes for recreation	Construction	Users of local PRoW	Medium	Adverse	Short term	Reversible	Local	Medium	Low	Minor		Low	Minor
	Operation	Users of local PRoW	Medium	Adverse	Long term	Reversible	Local	Low	Low	Moderate	TMP, SEP	Low	Minor
	Decommissioning	Users of local PRoW	Medium	Adverse	Short term	Reversible	Local	Medium	Low	Minor		Low	Minor
Increased use of local services	Construction	Residents (Direct Aol)	Medium	Adverse	Short term	Reversible	Local	Low	Low	Minor		Low	Minor
	Construction	Residents (Indirect Aol)	Low	Adverse	Short term	Reversible	Local	Low	Low	Minor		Low	Minor
	Construction	Businesses within the Aol	Low	Beneficial	Short term	Reversible	Local	Medium	Low	Minor	LEP, CDP	Medium	Moderate
	Decommissioning	Residents (Direct Aol)	Medium	Adverse	Short term	Reversible	Local	Low	Low	Minor		Low	Minor
	Decommissioning	Residents (Indirect Aol)	Low	Adverse	Short term	Reversible	Local	Low	Low	Minor		Low	Minor
	Decommissioning	Businesses within the Aol	Low	Beneficial	Short term	Reversible	Local	Medium	Low	Minor	LEP, CDP	Low	Minor
Increased exposure to traffic incidents	Construction	Road users within the Aol	Medium	Adverse	Short term	Reversible	Regional	Low	Low	Minor		Low	Minor
	Decommissioning	Road users within the Aol	Medium	Adverse	Short term	Reversible	Regional	Low	Low	Minor		Low	Minor
Annoyance related to the presence of the Proposed Development	Construction	Residents (Direct Aol)	Medium	Adverse	Short term	Reversible	Local	Medium	Medium	Moderate	SEP, CDP	Low	Minor
	Construction	Landowner	Low	Adverse	Short term	Reversible	Local	Low	Low	Minor		Low	Minor
	Operation	Residents (Direct Aol)	Medium	Adverse	Long term	Reversible	Local	Medium	Medium	Moderate	SEP, CDP	Low	Minor
	Operation	Landowner	Low	Adverse	Long term	Reversible	Local	Low	Low	Minor		Low	Minor

22.10 CUMULATIVE IMPACTS

- 22.10.1 The impacts listed above may be exacerbated by the number of wind and solar farms in the area. Cumulative impacts could have temporal, spatial and synergic effects due to workers from different projects placing a greater strain on existing services, aggregated traffic and accumulated changes to place-based attachment in the area.
- 22.10.2 There are several existing wind turbines within the area, the nearest being three 100m tip high wind turbines at Pen Bryn Oer 1.6km to the east, a single 77m tip high turbine at Pengarnddu Industrial Estate 2.1km to the north-west, and a single 74m tip high wind turbine at Tafarnaubach Industrial Estate, Tredegar 2.4km to the north-east. There is one existing solar farm within the area, approximately 2.4km to the south-west. See Chapter 2 EIA Process for more information on operational wind and solar farms in the area, as well as scoping, consented and in planning Developments.

22.11 SUMMARY

- 22.11.1 This chapter presented the expected health impacts from the Proposed Development on the surrounding area, both beneficial and adverse.
- 22.11.2 In order to assess the impacts, this chapter described the health data as the baseline conditions within two Areas of Influence (AoI): Direct and Indirect. Based on the socio-economic baseline from Chapter 21, a list of “social receptors” (i.e., people) was identified and followed in this Chapter.
- 22.11.3 Baseline data collection showed that Rhymney and the surrounding areas are more deprived than the County and National population in terms of health, with generally lower health rates, strained levels of care service provision, higher proportion of population with disabilities, and generally higher levels of WIMD categories (chronic conditions, long-term illness, premature deaths, mental health conditions, cancer incidences, and child obesity) when compared to County and National levels.
- 22.11.4 Expected impacts from pathway activities included: reduced use of PRoWs routes for recreation, increased use of local services, increased exposure to traffic incidents, and annoyance related to the presence of the Proposed Development.
- 22.11.5 This assessment used a two-staged impact assessment methodology, with a pre-mitigation assessment considering the implementation of expected industry standard practices and a post-mitigation assessment with additional mitigation and enhancement measures, resulting in a residual impact. Impact significance is based on

the correlation between receptor sensitivity and impact magnitude, with specific criteria for socio-economic and health aspects.

- 22.11.6 The assessment identified two minor beneficial impacts which, considering the implementation of enhancement measures, resulted in **one moderate beneficial impact** (significant). Three moderate adverse impacts were identified in the pre-mitigation assessment. Following the implementation of mitigation measures, they resulted in three minor adverse impacts (not significant).
- 22.11.7 Suggested mitigation and enhancement measures, include extending the scope of the Local Employment Plan (LEP) to include health inequality reduction goals, a Community Development Plan (CDP) to guide the expected community fund based on community priorities, a Stakeholder Engagement Plan (SEP) to build and maintain inclusive means of participation and feedback collection, as well as specific additions to the Traffic Management Plan (TMP) concerning the provision of alternative routes in case PRoWs are affected.

DRAFT