

H2Teesside Project

Environmental Statement

Volume III – Appendices

Appendix 23E: Socio-economic Cumulative Assessment

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The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended)

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



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23E.0 SOCIO-ECONOMIC CUMULATIVE ASSESSMENT

23E.1 Introduction

23E.1.1 This cumulative assessment has been prepared to assess the cumulative socio-economic effects of ~~the following three~~ proposed developments by bp in Teesside. This will allow the Applicant to understand the combined impact of its own proposed projects, namely:

- H2Teesside (The Proposed Development) (DCO ~~application~~ reference EN070009)
- HyGreen (Town and Country Planning Act application ~~to be~~ submitted to Redcar and Cleveland Borough Council in April 2024 (Reference R/2024/0271/ESM) (ID 222)); and
- Net Zero Teesside (DCO ~~application~~ reference EN010103 with the DCO ~~made~~granted on 16 February 2024) (ID 3).

23E.1.2 Hereafter these developments are referred to as the “three cumulative projects” when referenced collectively. The following factors are assessed as part of this cumulative assessment for all three cumulative projects:

- The overlap of the construction programmes;
- The combined effect of employment in the construction and operational phases of the three cumulative projects;
- The cumulative temporary effect on demand in the local housing market and for tourist rental accommodation; (including holiday lets) during construction of the three cumulative projects;
- Any potential for combined skills and training programs run by the three cumulative projects;
- The combined effect of employment generated on other socio-economic receptors (Public ~~Right~~Rights of Way (PRoW), open space land, community facilities, land take, etc);
- The cumulative effect on demand for GP surgeries; and
- The cumulative effect on the demography of the area and community disruption.

23E.2 Project Background and Assumptions

Assumptions Across the Three Cumulative Projects

23E.2.1 This section provides an overview of the programmes for the three cumulative projects, and the overlap between these, for the construction and operation phases. The assumptions for these phases of the three cumulative projects are based on the latest available information from the Applicant. Unless stated

otherwise, the assumptions have primarily been taken from the following three socio-economics and land use chapters to inform this assessment:

- Chapter 18: Socio-economics and Land Use (~~ES Volume I, EN070009/APP/6.2);[APP-071];~~
- Chapter 17: Socio-economics and Land Use (~~no planning reference as application not yet submitted~~ES Volume I, R/2024/0271/ESM) of the Environmental Statement (ES) for HyGreen; (~~bp, 2024~~); and
- Chapter 20: Socio-economics and Tourism (ES Volume I, EN010103/APP/6.1) of the ES for Net Zero Teesside (NZT) (bp, 2021).

Construction Programme

H2Teesside

23E.2.2 The construction programme for the Proposed Development will begin in 2025 and will be split into two phases. Phase 1 will last approximately three years to 2028, with Phase 2 commencing thereafter for another two years, with overall construction expected to be completed by 2030 - refer to Chapter 5: Construction Programme and Management (~~ES Volume I, EN070009/[APP/6.2)-057]~~ of the Proposed Development. ~~Construction phase~~The enabling works for the construction of Phase 2 ~~includes an~~ overlap with the operational phase of Phase 1 in Q1 and Q2 2028.

23E.2.3 Construction workforce peak numbers are approximately 1,300 ~~gross~~ construction workers (gross) per day across both Phases 1 and 2. The employment assessment ~~will assess~~has assessed the minimum employment as a worst-case scenario, the number of direct construction workers has been estimated at 800 ~~gross~~ construction workers (gross) based on minimum estimates for the construction phase of the Proposed Development. This is assumed as the minimum employment across the required workforces for both Phase 1 and Phase 2 of the construction period.

HyGreen

23E.2.4 The construction programme for HyGreen is ~~estimated~~anticipated to ~~begin~~commence in 2025 and last ~~for approximately three years,~~until 2028. ~~– a total duration of 36 months.~~ During this period, there will be an average of ~~435 gross~~346 construction workers (gross) per month in total, with a peak of 500 ~~gross~~ construction workers in 2025 and 2026.

Net Zero Teesside

23E.2.5 The ~~estimated~~anticipated construction programme for Net Zero Teesside (NZT) will commence in Q4 2024 and will last approximately four years until Q4 2028. Over the peak years (2025 to 2027), the development of NZT will lead to an average of 1,760 gross construction workers per annum.

Cumulative Construction Programme

23E.2.6 Table 23E-1 shows the expected construction programmes of the three cumulative projects. This shows that all three projects overlap in the years 2025 to 2028.

Table 23E-1: Indicative Cumulative Construction Timetable

YEAR	2024	2025	2026	2027	2028	2029	2030
H2TeessideThe Proposed Development							
HyGreen (estimated anticipated)							
NZT (estimated) Net Zero Teesside (anticipated)							

Operational Programme

H2Teesside

23E.2.7 The operational phase for the Proposed Development is expected to last for 25 years from 2030. For both the Phase 1 and Phase 2 elements of the Proposed Development, the operational workforce will peak at 130 operational workers. The minimum number of workers will be 60 operational workers in the operational phase, for both Phase 1 and Phase 2.

HyGreen

23E.2.8 The ~~estimated~~[anticipated](#) operational phase for HyGreen is expected to last 20 years from 2028. In this phase, gross operational employment will be an average of 10 workers on site in a working week (Monday to Friday). In addition, in phases of maintenance, the number of workers onsite will increase ~~by 32~~, to 42 workers in total. These phases are expected to occur every 24 months in the operational phase.

Net Zero Teesside

23E.2.9 The estimated operational phase for ~~Net Zero Teesside~~[NZT](#) will begin in 2028 and will last approximately 25 years, with the potential for an operational life of up to 40 years for the CO₂ (Carbon Dioxide) Gathering Network, HP Compressor Station and CO₂ Export Pipeline. The development of NZT will lead to up to 100 Full Time Equivalent (FTE) gross permanent jobs per annum during the operation and maintenance phase.

Cumulative Operational Worker Programme

23E.2.10 Table 23E-2 shows the expected operational worker profile over the operational years of the three cumulative projects. It should be noted that:

-
- The Proposed Development and HyGreen overlap from 2030 to 2047;
 - The Proposed Development and [Net Zero Teesside NZT](#) overlap from 2030 to 2053; and
 - All three cumulative projects overlap between 2030 and 2047.

Table 23E-2: Indicative Cumulative Operational Timetable

Year	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055
H2TeessideThe Proposed Development																														
HyGreen (estimated)																														
NZT (estimated)																														

23E.3 Cumulative Assessment Methodology

23E.3.1 This section provides an overview of the methodology used to complete this assessment of effects for the three cumulative projects.

23E.3.2 This cumulative assessment ~~will consider~~has considered the worst-case scenario for all three cumulative projects. This is in line with the principles of the 'Rochdale Envelope' approach, where appropriate, in line with the Planning Inspectorate's (the Inspectorate) Advice Note 9 (The Inspectorate, 2018). This involves assessing the maximum (or where relevant, minimum) realistic worst-case parameters for the elements where flexibility needs to be retained (building dimensions or operational modes for example).

23E.3.3 In this ~~chapter~~appendix, the minimum scenario ~~will be~~has been assessed for employment, and skills and training opportunities, as they are beneficial impacts. In contrast, maximum parameters for impacts on other receptors (such as PRoW, development land and the employment effect on the housing market and local services) ~~will be~~has been assessed, whereby the 'worst-case scenario' is considered, as the effect of the three cumulative projects are expected to be adverse. This follows the methodology of all three cumulative projects.

23E.3.1 The worst-case scenario is also considered in relation to the project lifecycles. When this occurs, the largest beneficial impact will occur for positive effects (for example, employment and skills opportunities), and the largest adverse impact will occur for negative effects (for example; PRoW, Open Space and private assets).

23E.3.2 Using the information detailed in Section 23E.2 of this Appendix, in the construction phase, the three cumulative projects are estimated to overlap from 2025 to 2028. Given this, the assessment year will be 2025. This is when the three cumulative projects overlap, and their cumulative impact is the largest. This is considered the same as assessing any of the years between 2025 and 2028 given the overlap that also exists in these years.

23E.3.3 The operation programmes of the three cumulative projects are estimated to overlap between 2030 and 2047. For this assessment, ~~the year 2030 is~~has been chosen as the result of the assessment, as this ~~will be~~is the same as assessing any of the individual years from 2030 to 2047.

23E.3.4 All individual assessments for all three cumulative projects have considered their own levels of magnitude, sensitivity and level of effects. These are used as a basis to form the judgement for the magnitude, sensitivity and level of subsequent cumulative effects for each receptor. Where applicable, if a receptor is affected by more than one of the three cumulative projects, this will lead to a combined effect on that given receptor. The scale of ~~this~~the combined effect ~~this will be~~has been considered, and will likely lead to a greater cumulative effect on the given receptor.

Cumulative Study Area

23E.3.5 The Study Area for the cumulative assessment of effects is represented by the largest study area of the three cumulative projects, in order to capture the largest possible area for potential cumulative effects. The Proposed Development and

HyGreen use the same Wider Impact Area to assess effects, which is the Middlesbrough and Stockton Travel To Work Area (TTWA), defined by geographic areas from the 2021 Census (ONS, 2021). Net Zero Teesside also uses these boundaries; however, as Census 2021 data had not been released at the time of writing of the ~~Net Zero Teesside NZT~~ ES, the ~~Net Zero Teesside NZT~~ assessment uses this area as defined by the boundaries in the 2011 Census (ONS, 2011). As a result, there are minor discrepancies between the two definitions of the Middlesbrough and Stockton TTWA. For the purposes of this assessment, the 2021 Census version of the Middlesbrough and Stockton TTWA is used, but this discrepancy is noted as a caveat of this cumulative assessment.

Significance Criteria and Limitations

- 23E.3.6 The significance of any cumulative effects is based on the significance criteria used in Section 18.3 of Chapter 18: Socio-economics and Land Use (~~ES Volume 1, EN070009/APP/6.2).~~ [APP-071].
- 23E.3.7 The assessment of cumulative socio-economic effects is based on professional judgement, drawing on relevant guidance as set out in Chapter 18: Socio-economics and Land Use (~~ES Volume 1, EN070009/APP/6.2).~~ [APP-071]. This considers both potential beneficial and adverse impacts that the three cumulative projects are likely to have on socio-economic receptors.
- 23E.3.8 ~~Net Zero Teesside NZT~~ is two projects, jointly consented (in terms of onshore development) in the NZT DCO, with each project to be undertaken by a separate company (NZT Power and NZNS Storage), and which include and are led by ~~bp~~ [the Applicant](#). The Proposed Development and HyGreen are both run in partnerships which include and are led by ~~bp~~ [the Applicant](#). Due to these ownership structures, there is potential for economies of scale and effective co-ordination to maximise project benefits and manage any adverse impacts where practical. As such, the assumption that all ~~3~~ [three](#) projects would be constructed separately, by different contractors, is a worst case scenario.
- 23E.3.9 Due to the differences in submission dates, the latest progress made at the time of this ~~ES~~ submission and data available for each assessment, there will be information asymmetries between the three Environmental Statements.

Impacts Scoped out of Assessment

- 23E.3.10 The construction and operational phases are assessed as part of this cumulative assessment. The decommissioning phase is scoped out of this cumulative assessment, as it is considered that the projects have different operational life spans and therefore the decommissioning phases are not likely to coincide, and the impacts would not be more significant than those considered for the construction phase.
- 23E.3.11 Where the effect on a given receptor is not considered for two or more of the individual assessments for the Proposed Development, HyGreen and ~~Net Zero Teesside NZT~~, the effects of that given receptor are assumed to have no cumulative effect and are excluded from this assessment.

23E.3.12 ~~This includes the~~The following receptors are scoped out in the **operational phase**:

- Skills and Training opportunities;
- Agricultural and Industrial Land;
- Education and Community Facilities; and
- Demography and Community Disruption.

23E.3.13 **Cumulative operational effects** of the workforce on the local housing market have also been scoped out of this cumulative assessment as they are not considered within any of the respective chapters due to the low numbers of operational staff for each development.

23E.4 Cumulative Construction Phase Impacts and Likely Significant Effects

23E.4.1 This section details the cumulative construction phase impacts, and their subsequent effects, resulting from the three cumulative projects. The significance of these effects is also assessed in this section.

Construction Employment

23E.4.2 Table 23E-3 summarises the additionality assumptions used by the three cumulative projects. These have been used to calculate the net additional construction jobs, using the gross job figures supplied by the Applicant as a base assumption in each assessment. Further detail on the rationale for these assumptions can be found in the respective assessments in each Socio-economics and Land Use chapter for the three cumulative projects.

Table 23E-3: Additionality Assumptions for Construction Employment Assessments

PROJECT	DISPLACEMENT	LEAKAGE	MULTIPLIER
<u>H2TeessideThe Proposed Development</u>	25%	25%	1.3
HyGreen	25%	25%	1.3
Net Zero Teesside	25%	50%	1.85

23E.4.3 Using this, the following assessment of construction worker employment effects were made by the respective socio-economics and land use chapters for the three cumulative projects, as shown in Table 23E-4. These figures show the peak construction workforce for each of the three cumulative projects.

Table 23E-4: Cumulative Construction Employment Assessments

PROJECT	NET CONSTRUCTION WORKERS PER ANNUM	TIMETABLE OF WORKS	IMPACT OF MAGNITUDE OF IMPACT	SENSITIVITY OF RECEPTOR	EFFECT AND SIGNIFICANCE
H2 Teesside The Proposed Development (estimated)	780	2025 to 2030	Low	High	Moderate Beneficial (Significant)
HyGreen (estimated)	424 335	2025 to 2028	Low	Medium	Minor Beneficial (Not Significant)
Net Zero Teesside (estimated)	2,440	2024 to 2028	High	Medium	Major Beneficial (Significant)
Total	3,644555				

23E.4.4 To note, the anticipated construction workforce generated by [Net Zero Teesside NZT](#) is 2,440 net construction jobs, which is calculated as the equivalent of approximately 240 FTE permanent jobs during the construction period. For this assessment, and for consistency with the assessments for the Proposed Development and HyGreen, 2,440 net construction jobs ~~will behave been~~ used as the basis for [Net Zero Teesside NZT](#) construction employment.

23E.4.5 At the peak construction period, when the three cumulative projects overlap in the assessment year 2025, it is estimated that there will be ~~3,644~~[555](#) net construction workers across the three sites. Given that ~~the Applicant~~ [is the](#) operator of all three sites, there may be potential for this figure to be lower, as construction work could be managed to make best use of the workforce available, maximise project benefits and mitigate significant adverse effects. Construction employment in the assessment year 2025 represents 36% of the total construction workforce estimated for Middlesbrough and Stockton TTWA in 2022 (ONS, 2022). As a result, the cumulative magnitude of these three cumulative projects is **High**.

23E.4.6 The sensitivity of the construction workforce is directly dependent on the number of projects taking place across Middlesbrough and Stockton TTWA. As shown in Section 18.8 of Chapter 18: Socio-economics and Land Use (~~ES Volume 1, EN070009/APP/6.2), [APP-071]~~ multiple projects are taking place within this study area. There is a short-term risk of labour demand outpacing labour supply, resulting in a labour shortage, given that the three cumulative projects assessed in this ~~Appendix~~[appendix](#) and other projects are also simultaneously in their construction phase in this study area. The construction workforce in Middlesbrough and Stockton TTWA is likely to also increase in response to sustained demand in the area, through the geographical movement of labour, over the short to medium term. Given these factors, it is assessed that the sensitivity of this receptor is **High**.

23E.4.7 Therefore, this results in a **Major Beneficial (Significant)** cumulative construction worker effect.

Local Housing Market and Tourist Accommodation

23E.4.8 The following assessment of local housing market and tourist accommodation effects were made in the respective socio-economics and land use chapters for the three cumulative projects, as shown in Table 23E-5.

Table 23E-5: Cumulative Construction Local Housing Market and Tourist Accommodation Assessments

PROJECT	NON-HOME BASED CONSTRUCTION WORKFORCE	NON HOME BASED RESIDENTIAL AND TOURIST ROOM DEMAND	IMPACT OF MAGNITUDE OF IMPACT	SENSITIVITY OF RECEPTOR	EFFECT AND SIGNIFICANCE
H2TeessideThe Proposed Development	317	317	Low	Medium	Minor Adverse (Not Significant)
HyGreen	107120 ¹	107120 ²	Low	Medium	Minor Adverse (Not Significant)
Net Zero Teesside	1,220	1,220 ³	Medium	Low ⁴	Minor Adverse (Not Significant)
Total	1,644657				

23E.4.9 The following levels of leakage have been assumed for each assessment, along with their justifications from each assessment, noted below:

- the Proposed Development and HyGreen – 25% has been assumed for these assessments, as it has been assumed that the majority of benefits will go to people “living in the target area”. This is in line with Homes and Communities Agency (HCA) Additionality Guidance (HCA, 2014).
- [Net Zero TeessideNZE](#) – 50% has been assumed for this assessment, due to the large scale of construction employment anticipated. This will likely require sourcing higher levels of labour from outside the study area.

23E.4.10 Given the leakage levels above, the cumulative construction workforce will require approximately 1,644657 ‘non-home based’ employees to support the construction phase. This is the peak non-home based employees required in the assessment year of 2025.

¹ This figure reflects the final HyGreen Town and Country Planning Act planning application submitted to Redcar and Cleveland Borough Council in April 2024 (Reference R/2024/0271/ESM).

² This figure reflects the final HyGreen Town and Country Planning Act planning application submitted to Redcar and Cleveland Borough Council in April 2024 (Reference R/2024/0271/ESM).

³ Assumed given the employment assessment for Net Zero Teesside. This is because the value is not calculated within the Net Zero Teesside Socio-economics chapter but can be inferred using the assumptions detailed in Section 18.6 in Chapter 18: Socio-economics and Land Use (ES Volume I, EN070009/APP/6.2).

⁴ See section 23E.4 for an explanation of this difference.

23E.4.11 For this assessment, it is necessary to understand the availability of both residential and tourism accommodation to meet the labour demand for the three cumulative projects.

Rented Housing Supply

23E.4.12 The private rented homes sector is considered to be the principal sector for accommodating demand for housing from 'non-home based' construction workers in an urban development context. According to the English Housing Survey 2021 to 2022, in the North-east, approximately 15.5% of households were occupied by private renters (DLUHC, 2022). Applying this figure to the 202,733 households in the Middlesbrough and Stockton TTWA (ONS, 2021) implies that approximately 31,507 households are privately rented in the Middlesbrough and Stockton TTWA. Although no area-based statistics are available, when last recorded by the ONS in 2021, 6.1% of dwellings were unoccupied in England (ONS, 2023b), noting that not all of these properties would be available for occupancy. Taking a cautious approach that is in line with similar assessments for this receptor, it is assumed that 5% are available. This implies that there were 1,575 properties within the Middlesbrough and Stockton TTWA in 2021 that could potentially be occupied by construction workers.

Tourism Accommodation Supply

23E.4.13 In terms of shorter stays, bed and breakfast accommodation will also be able to support non-home based employees. The England Occupancy Survey provides data on occupancy for hotels and other accommodation businesses in the UK (Visit England, 2023). This shows that in 2023, occupancy rates peaked in July, at 85%. For the North-East region, this peak was slightly lower at 83% for July 2023. Using the occupancy rates as an approximation for the worst-case scenario for temporary accommodation in the Wider Impact Area, it is assumed that 17% of all hotels and accommodation would be available for short term accommodation for construction workers.

23E.4.14 CoStar has been used to calculate the number of bed and breakfast accommodation rooms (CoStar, 2024). The 60-minute drive time area from the Proposed Development [siteSite](#) has been used as a proxy for the Middlesbrough and Stockton TTWA, as this geographic area is not available on CoStar. This data shows that as of February 2024, there are 11,038 rooms available in the 60-minute drive time area. Applying the 17% vacancy rate to this value leads to 1,876 available rooms for the cumulative non-homebased employee workforce.

Summary of Available Accommodation for Non-Home Based Employees

23E.4.15 Table 23E-6 shows the local housing and tourism accommodation net surplus once the cumulative non-home based employees have been considered.

Table 23E-6: Cumulative Construction Local Housing Market and Tourist Accommodation Net Surplus

FACTOR	UNITS
Non-home based employees	1,644,657
Available private rental homes	1,575
Vacant tourist accommodation rooms	1,876
Net surplus	1,807,794

23E.4.16 This assessment assumes that there are 3,451 available homes and accommodation rooms in the Middlesbrough and Stockton TTWA. Assuming a worse case 1-to-1 ratio of non-home based workers to these homes and accommodation rooms, if all accommodation is filled, there will be a surplus of 1,807,794 homes and accommodation rooms available in the Middlesbrough and Stockton TTWA after considering the three cumulative projects.

23E.4.17 Given this extent of the cumulative construction workforce required to temporarily move to the Middlesbrough and Stockton TTWA, and the number of non-home based employees being larger than the available private rental homes, the cumulative magnitude is **High**.

23E.4.18 The sensitivity of the receptors is considered as medium in the Proposed Development and HyGreen, and low in [Net Zero Teesside. As Net Zero Teesside N.Z.T. As N.Z.T](#) was submitted to the Inspectorate prior to the submissions of the other two cumulative projects, the cumulative construction profile was smaller at the time of submission. For this assessment, given the size of the non-home based employee workforce, the receptors will have a limited capacity to absorb this change. However, there are alternative receptors presented in both the private rented and the tourist accommodation sector. Given this, the cumulative sensitivity is **Medium**.

23E.4.19 As a result, the cumulative effect on the local housing market and tourist accommodation is **Moderate Adverse (Significant)**.

Skills and Training Effects

23E.4.20 The following assessment of skills and training effects, shown in Table 23E-7, were made by the respective socio-economics and land use chapters for the three cumulative projects.

Table 23E-7: Cumulative Construction Skills and Training Assessments

PROJECT	SKILLS AND TRAINING PROGRAMMES OFFERED	IMPACT OF MAGNITUDE OF IMPACT	SENSITIVITY OF RECEPTOR	EFFECT AND SIGNIFICANCE
H2 Teesside The Proposed Development	Not assessed. The Applicant actively participates in the Green Jobs Delivery Group	N/A	N/A	N/A

PROJECT	SKILLS AND TRAINING PROGRAMMES OFFERED	IMPACT OF MAGNITUDE OF IMPACT	SENSITIVITY OF RECEPTOR	EFFECT AND SIGNIFICANCE
	and Local Skills Improvement Plan Advisory Group to provide industry leadership and influence to bolster skills and competency provisions for Teesside's clean energy projects. As this programme is under development the actual effect of the skills enhancement programme has not been assessed. However, it is envisaged that this programme will provide enhancement to the skills and employment opportunities to local community. Further details are provided in the Need Statement (EN070009/APP/5.3).			
HyGreen	Redcar and Cleveland Borough Council is providing support through providing employment and skills opportunities.	Low	Medium	Minor Beneficial (Not Significant)
Net Zero Teesside	Potential skills and employment programmes to be provided by the developer.	Low	Medium	Minor beneficialBeneficial (Not Significant)

23E.4.21 There are assessments on skills and training opportunities in the construction phase for HyGreen and [Net Zero TeessideNZE](#), but not for the Proposed Development, due to information being unavailable at the time of writing. The assessments [aresimilarare similar](#) for both HyGreen and [Net Zero TeessideNZE](#); there is potential for a positive effect, but there is currently insufficient detail to support a higher magnitude than “Low” for both assessments. In the assessment year of 2025, the overlap of the three cumulative projects could produce a larger cumulative effect as a result of the concurrent projects. However, there is not sufficient detail

provided to demonstrate this at the time of writing. As a result, the cumulative magnitude for this receptor remains at **Low**.

23E.4.22 HyGreen reports a medium sensitivity for skills and training receptors due to the receptors being able to “*relatively easily absorb the change*”. This is reflected by the low level of confirmed skills and training opportunities presented by HyGreen. In [Net Zero Teesside NZT](#), this is also assessed as medium, due to the lower level of the local populations’ qualifications compared to the national population. Given the insufficient detail for the skills and training programmes for both projects, the cumulative sensitivity is considered to be **Medium**, as it is expected that the labour force will be easily able to absorb the suggested programmes in their current form in the Middlesbrough and Stockton TTWA.

23E.4.23 As a result, the cumulative effect of construction skills and training programmes is **Minor Beneficial (Not Significant)**.

Agricultural and Industrial Land

23E.4.24 The following assessment of agricultural and industrial land effects were made by the respective socio-economics and land use chapters for the three cumulative projects, detailed in Table 23E-8.

Table 23E-8: Cumulative Construction Agricultural and Industrial Land Assessments

PROJECT	DESCRIPTION OF EFFECT	<u>IMPACT OF MAGNITUDE OF IMPACT</u>	SENSITIVITY OF RECEPTOR	EFFECT AND SIGNIFICANCE
H2TeessideThe Proposed Development	The Replacement Land at Cowpen Bewley is currently in agricultural use (Grade 4 and Grade 3 (undifferentiated)). There will be new woodland planting on the replacement land to compensate for the loss of woodland in Cowpen Bewley Woodland Park following the completion of the construction phase in consultation and with the agreement of Stockton-on-Tees Borough Council.	Low	Medium	Minor Adverse (Not Significant)
HyGreen	Minimal, no negative impacts expected on nearby development proposals.	Low	Medium	Minor Adverse (Not Significant)

PROJECT	DESCRIPTION OF EFFECT	IMPACT OF MAGNITUDE <u>OF IMPACT</u>	SENSITIVITY OF RECEPTOR	EFFECT AND SIGNIFICANCE
Net Zero Teesside	Not assessed	N/A	N/A	N/A

23E.4.25 The Proposed Development and HyGreen provide an assessment for agricultural and industrial land effects. For both assessments, the magnitude has been assessed as low, due to the minimal level of disruption, temporary nature of effects, and temporary level of land take. Given this, and that no specific agricultural and industrial land is noted as experiencing permanent land take, the cumulative magnitude is assessed to be **Low**.

23E.4.26 In terms of sensitivity, both the Proposed Development and HyGreen are considered medium given that the receptors may be somewhat vulnerable to any changes. There is no rationale to support a change to this sensitivity for the cumulative assessment given the subsequent assessments for the Proposed Development and HyGreen, and it is likely that these receptors will be able to absorb any changes resulting from the cumulative effects without a change to the economic viability of the sites. Therefore, the cumulative sensitivity is assessed to be **Medium**.

23E.4.27 As a result, the cumulative effect on agricultural and industrial land is **Minor Adverse (Not Significant)**.

Public Right of Way and Open Space

23E.4.28 The following assessment of PRoW and open space effects were made by the respective socio-economics and land use chapters for the three cumulative projects.

Table 23E-9: Cumulative Construction PRoW and Open Space Assessments

PROJECT	DESCRIPTION OF EFFECT	IMPACT OF MAGNITUDE <u>OF IMPACT</u>	SENSITIVITY OF RECEPTOR	EFFECT AND SIGNIFICANCE
H2TeessideThe Proposed Development	Permanent loss of 18,615 m ² of plantation woodland at Cowpen Bewley Woodland Park, which represents 6.2% of the park's total size. There will also be minor temporary disruption and severance to two PRoWs resulting from construction activities. Replacement	Low	Medium	Minor Adverse (Not Significant)

PROJECT	DESCRIPTION OF EFFECT	IMPACT OF MAGNITUDE OF <u>IMPACT</u>	SENSITIVITY OF RECEPTOR	EFFECT AND SIGNIFICANCE
	land, which will be planted to compensate for the loss of woodland within the Woodland Park, will be developed north of the A1185 (20,234 m ² , or 6.7% of the park's total size). Disruption of PROWs is only expected to last six months in total and the replacement land will be developed after the construction phase. Temporary disruption will also occur at the open space adjacent to Coatham Marsh to the east of the Main Site, leading to a temporary loss of 37,531 m ² of land, equivalent to 5.8% of the site during pipeline construction. This will be restored to its original state at the end of pipeline construction.			
HyGreen	HyGreen crosses a PROW along the A1085, where the Teesdale Way runs along the northern side of the A1085 just to the south of the Steel Works roundabout. However, no physical works are proposed to the highway in this location.	Negligible <u>Very Low</u>	Medium	Negligible (Not Significant)
Net Zero Teesside	The England Coast Path, Teesdale Way and PROW 116/31 may be	Low	Low	Negligible Adverse (Not Significant)

PROJECT	DESCRIPTION OF EFFECT	IMPACT OF MAGNITUDE <u>OF</u> <u>IMPACT</u>	SENSITIVITY OF RECEPTOR	EFFECT AND SIGNIFICANCE
	temporarily disrupted during construction.			

23E.4.29 In the 2025 assessment year, where the construction phases overlap, only the Proposed Development leads to minor disruption for users of PRoW and open space. There is only land take resulting from the Proposed Development, and this is considered to be minor, given the replacement land which will be installed at Cowpen Bewley Woodland Park. Walkers accessing PRoW close to the ~~three~~ cumulative projects could experience some disruption during the period when works are being undertaken, but any disruption is anticipated to be temporary. The scope for combined effects is limited because the receptors detailed above are not affected by more than one of the three cumulative projects at any given time during this phase.

23E.4.30 The sensitivity of this receptor for all three cumulative projects is assessed to be Medium, with the exception of ~~Net Zero Teesside~~NZT, which infers that the receptors may be somewhat vulnerable to any changes. Therefore, to be conservative, the cumulative sensitivity is also assessed to be **Medium**.

23E.4.31 Given the factors detailed in this section, the cumulative magnitude is assessed to be **Low**.

23E.4.32 Given this, the cumulative effect on PRoW and Open Space is **Minor Adverse (Not Significant)**.

Private Assets (Residential and Business Premises)

23E.4.33 The following assessment of effects on private assets were made by the respective socio-economics and land use chapters for the three cumulative projects.

Table 23E-10: Cumulative Construction Private Assets Assessments

PROJECT	DESCRIPTION OF EFFECT	IMPACT OF MAGNITUDE OF IMPACT	SENSITIVITY OF RECEPTOR	EFFECT AND SIGNIFICANCE
H2 Teesside The Proposed Development	There are no residential properties within the boundary of the Proposed Development Site. Occupied businesses, their apparatus and operational accesses have been avoided where possible in the Proposed Development Site. During construction, access will be maintained to ensure continuity of operations. Where required these arrangements have been formalised by agreement with business landowners in the form of protective provisions.	Low	Medium	Minor Adverse (Not Significant)
HyGreen	Minor disruption to business premises, but no land take. No effect on residents.	Low	Medium	Minor Adverse (Not Significant)
Net Zero Teesside	No direct impacts.	Low	Medium	Minor Adverse (Not Significant)

23E.4.34 In the 2025 assessment year, where the construction phases overlap, both the Proposed Development and HyGreen lead to minor disruption for businesses, and the Proposed Development leads to minor disruption for residents. There are no direct impacts on this receptor resulting from [Net Zero Teesside-NZT](#). There could be potential for combined effects at business premises which are affected by all three cumulative projects, due to an increased intensity of the cumulative construction programme, especially if the construction works lead to adverse effects in close proximity to one another, or if they directly affect the same receptor. Given the potential for combined effects to private assets, the cumulative magnitude is assessed to be **Medium**.

23E.4.35 The sensitivity of this receptor for all three cumulative projects is assessed to be Medium, which infers that the receptors may be somewhat vulnerable to any changes. This rationale also holds for the cumulative assessment given that the

private assets identified in the baselines for all three projects are similar. Therefore, the cumulative sensitivity is also assessed to be **Medium**.

23E.4.36 As a result, the cumulative effect on private assets is assessed to be **Moderate Adverse (Significant)**.

Education and Community Facilities

23E.4.37 The following assessment of effects education and community facilities were made by the respective socio-economics and land use chapters for the three cumulative projects, as shown in Table 23E-11.

Table 23E-11: Cumulative Construction Education and Community Facilities Assessments

PROJECT	DESCRIPTION OF EFFECT	IMPACT OF MAGNITUDE OF IMPACT	SENSITIVITY OF RECEPTOR	EFFECT AND SIGNIFICANCE
H2 Teesside The Proposed Development	Minor disruption, no land take.	Low	Medium	Minor Adverse (Not Significant)
HyGreen	Not assessed	N/A	N/A	N/A
Net Zero Teesside	This receptor is not assessed directly but is included as part of an assessment on demographics and community disruption. This found no significant difference from baseline conditions is expected in relation to demand for local services, such as schools or health services, during the construction phase, and therefore no additional provision of local services or infrastructure is required.	Low	Medium	Minor Adverse (Not Significant)

23E.4.38 For the 2025 assessment year, the effect on education and community facilities is only directly assessed in the Proposed Development, but is indirectly assessed in [Net Zero Teesside NZT](#) through the assessment of demographics and community disruption. In both cases, the magnitude is considered low because there is no land take and minor disruption. There are no direct impacts on specific educational sites and community facilities, so the scope for combined effects is limited. Given these factors, and that this receptor is not assessed for HyGreen, the cumulative magnitude is assessed to be **Low**.

23E.4.39 The sensitivity for both the assessment in HyGreen and Net Zero Teesside is medium, given the close location of these receptors, and the ability of the population to experience disruption without a change to their economic well-being.

This sensitivity is considered to be the same in the cumulative assessment, given the overlap between receptors in the cumulative projects. Therefore, the cumulative sensitivity is **Low**.

23E.4.40 Given this, the cumulative effect on education and community facilities is **Minor Adverse (Not Significant)**.

Development Land

23E.4.41 The following assessment of development land effects were made by the respective socio-economics and land use chapters for the three cumulative projects, see Table 23E-12.

Table 23E-12: Cumulative Construction Development Land Assessments

PROJECT	DESCRIPTION OF EFFECT	<u>IMPACT OF MAGNITUDE OF IMPACT</u>	SENSITIVITY OF RECEPTOR	EFFECT AND SIGNIFICANCE
H2TeessideThe Proposed Development	Minimal disruption, no land take.	Low	Medium	Minor Adverse (Not Significant)
HyGreen	No disruption expected and no land take in this phase.	Low	Medium	Minor Adverse (Not Significant)
Net Zero Teesside	Not assessed	N/A	N/A	N/A

23E.4.42 The effect on development land is assessed in the Proposed Development and HyGreen, with both concluding that there is a low magnitude of effects to this receptor. This is due to the minimal disruption caused, and that there is no land take. Section 18.6 of Chapter 18: Socio-economics and Land Use ([ES Volume 1, EN070009/APP/6.2](#))[APP-071] states that the development “*is anticipated to be an Upper Tier Control of Major Accident Hazards (COMAH) installation, which means that the Proposed Development will have to comply with COMAH regulations. The Health and Safety Executive publish public information on establishments subject to COMAH regulations meaning that those that have concerns will be able to access information regarding risks posed by the Proposed Development and how the Applicant has reduced these as low as reasonably practicable.*” This infers that the cumulative magnitude of impact is unlikely to change, especially as there is no land take in this stage, and COMAH risks are controlled for through mitigation. Therefore, the cumulative magnitude is **Low**.

23E.4.43 The sensitivity of this receptor is medium in both the Proposed Development and HyGreen assessments. This is due to the close location of these receptors, and the ability of the receptor to experience disruption without a change to the economic viability of the development land. Given this, the cumulative sensitivity is also considered **Medium** for this assessment.

23E.4.44 Resulting from this, the cumulative effect is **Minor Adverse (Not Significant)**.

Demography and Community Disruption

23E.4.45 The following assessment of demography and community disruption effects were made by the respective socio-economics and land use chapters for the three cumulative projects, as shown in Table 23E-13.

Table 23E-13: Cumulative Construction Demography and Community Disruption Assessments

PROJECT	DESCRIPTION OF EFFECT	<u>IMPACT OF MAGNITUDE OF IMPACT</u>	SENSITIVITY OF RECEPTOR	EFFECT AND SIGNIFICANCE
H2TeessideThe Proposed Development	Minimal disruption, no requirement for increased supply of local services.	Low	Medium	Minor Adverse (Not Significant)
HyGreen	Not assessed	N/A	N/A	N/A
Net Zero Teesside	No significant difference from baseline conditions is expected in relation to demand for local services.	Low	Medium	Minor Adverse (Not Significant)

23E.4.46 In the assessments for the Proposed Development and [Net Zero TeessideN2T](#), the magnitude is considered low because of no land take, minor disruption and, therefore, no requirement for an increase in the provision of local services. There are no direct impacts on specific community areas, so the scope for combined effects is limited. It is noted in [Net Zero TeessideN2T](#) that whilst in-migration to the local and wider areas of influence for employment opportunities is expected (principally for highly skilled or niche construction or supervisory roles) the scale of this is not anticipated to significantly affect the demographic characteristics of the local or wider areas. Given this, and that this receptor is not assessed for HyGreen, the cumulative magnitude is assessed to be **Low**.

23E.4.47 The sensitivity of these receptors is considered medium in both the Proposed Development and the [Net Zero TeessideN2T](#) area, due to the local population having a moderate capacity to experience these impacts without a change to their economic wellbeing. As no specific sites are adversely affected in either assessment, this rationale holds for the cumulative assessment, and therefore the cumulative sensitivity is considered to be **Medium**.

23E.4.48 Given these factors, the effect on demography and community disruption is **Minor Adverse (Not Significant)**.

Demand for GP Surgeries

23E.4.49 The following assessment of GP surgery effects were made by the respective human health chapters for the three cumulative projects, as shown in Table 23E-14.

Table 23E-14: Cumulative Construction GP and Surgeries Assessment

<u>Project</u> <u>PROJE</u> <u>CT</u>	<u>Description of</u> <u>effect</u> <u>DESCRIPTI</u> <u>ON OF EFFECT</u>	<u>Impact of</u> <u>Magnitude</u> <u>MAGNITU</u> <u>DE OF IMPACT</u>	<u>Sensitivity of</u> <u>receptor</u> <u>SENSITIVI</u> <u>TY OF RECEPTOR</u>	<u>Effect and</u> <u>significance</u> <u>EFFE</u> <u>CT AND</u> <u>SIGNIFICANCE</u>
H2 Teesside The Proposed Development	Limited impacts to GP access due to small proportion of construction workers who may move into the area.	Low	Medium	Minor Adverse (Not Significant)
HyGreen	Limited impacts to GP access due to small proportion of construction workers who may move into the area.	Low	Medium	Minor Adverse (Not Significant)
Net Zero Teesside	Not assessed	N/A	N/A	N/A

23E.4.50 Although the impact on GP surgeries was not assessed for [Net Zero Teesside NZT](#), it is evident that at the construction period peak, the cumulative construction employment can be used to estimate this impact. When the three cumulative projects overlap in the assessment year 2025, it is estimated that there will be 3,644 net construction workers across the three sites. These construction workers may place extra demand on GP surgeries if they move to the area.

23E.4.51 As noted in [Section Paragraph 23E.4.10](#), the cumulative construction workforce will require approximately [1,644657](#) 'non-home based' employees to support the construction phase. This is the peak non-home-based employees required in the assessment year of 2025. Using the latest available data on GP to patient ratios (NHS Digital, 2024), in a worst-case scenario where every peak 'non-home based' employee would require registration at a local GP, the ratio of patients per GP would increase slightly to 1,797 following the addition of the non-home based employees. This is still under the target of 1,800 discussed below. Therefore, the cumulative magnitude of impact is assessed to be **Low**.

23E.4.52 GP practices local to the three cumulative projects are, on average, operating in line with benchmark patient to GP ratios (NHS Digital, 2024). There are 95,390 patients registered at the surgeries identified in the human health assessments of H2 Teesside and HyGreen, and 54 GPs (no assessment for [Net Zero Teesside NZT](#)). This equates to a ratio of 1,766 patients per GP, which is below the Royal College of General Practitioners target of 1,800 patients per GP (Royal College of General Practitioners, 2005). The area also generally experiences low levels of deprivation with respect to the Indices of Multiple Deprivation (IMD) barriers to housing and services domain (MHCLG, 2019). Despite this, levels of poor health among the local population are higher than average, as detailed in Section 22.4 of Chapter 22: Human Health ([ES Volume 1, EN070009/APP/6.2](#))-[APP-075]. Therefore, existing GP services and their users have been assessed as having **Medium** cumulative sensitivity.

23E.4.53 Given these factors, the cumulative effect on demand for GP surgeries is **Minor Adverse (Not Significant)**.

23E.5 Cumulative Operational Phase Impacts and Likely Significant Effects

23E.5.1 This section details the cumulative operation phase impacts, and their subsequent effects, resulting from the three cumulative projects. The significance of these effects is also assessed in this section.

Operational Employment

23E.5.2 The following assessment of operational worker employment effects were made by the respective socio-economics and land use chapters for the three cumulative projects, as shown in Table 23E-15. This assessment uses the same assumptions for displacement, leakage and the multiplier as stated in Table 23E-3.

Table 23E-15: Cumulative Operational Employment Assessments

PROJECT	NET OPERATIONAL WORKERS PER ANNUM	TIMETABLE OF WORKS	IMPACT OF MAGNITUDE MAGNITUDE OF IMPACT	SENSITIVITY OF RECEPTOR	EFFECT AND SIGNIFICANCE
H2TeessideThe Proposed Development	58	25 years from 2030	Very Low	Medium	Negligible (Not Significant)
HyGreen	11 (alongside 32 in maintenance phases every 24 months)	20 years from 2028	Negligible	Medium	Negligible (Not Significant)
Net Zero Teesside	130	25 years from 2026, with the potential for an operational	Medium	Medium	Moderate Beneficial (Not Significant)

PROJECT	NET OPERATIONAL WORKERS PER ANNUM	TIMETABLE OF WORKS	IMPACT OF MAGNITUDE MAGNITUDE OF IMPACT	SENSITIVITY OF RECEPTOR	EFFECT AND SIGNIFICANCE
		life of up to 40 years for the CO ₂ Gathering Network, HP Compressor Station and CO ₂ Export Pipeline.			
Total	199 (231 when overlapping with the maintenance phase for HyGreen)				

23E.5.3 The cumulative workforce will peak between 2030 and 2047, in the specific years when maintenance activities are required at HyGreen, leading to a net additional workforce of 231 in these years. The magnitude of operational worker impacts varies according to the size of the workforce, from negligible (HyGreen) to medium (~~Net Zero TeessideN2T~~). The net additional workforce represents less than 1% of total employment in the Middlesbrough and Stockton TTWA (ONS, 2022), however, the permanency of these roles (notwithstanding the semi-permanent maintenance roles at HyGreen) leads to an increased impact, especially in the overlapping periods of the three cumulative projects. The cumulative magnitude is therefore **Medium**, given the permanent improvements to the socio-economic conditions of the labour force and the moderate impacts expected on local businesses and employees.

23E.5.4 The sensitivity of the receptor has been assessed as medium for all three cumulative projects. This is also the cumulative sensitivity for this assessment. It is assumed that the roles at each of the three cumulative projects will typically be specialised in manufacturing, professional, scientific and technical roles, with a smaller proportion filled by maintenance roles. Given this, those benefitting from the three cumulative projects will generally be limited to employees specialising in these industries, which may limit the opportunities given to the wider labour force in the Middlesbrough and Stockton TTWA. However, the labour force will be able to absorb this permanent increase in employment, therefore the cumulative sensitivity is **Medium** in this assessment.

23E.5.5 As a result, the cumulative effect on operational employment is **Moderate Beneficial (Significant)**.

Public Right of Way and Open Space

23E.5.6 The following assessments of PRow and open space effects were made by the respective socio-economics and land use chapters for the three cumulative projects.

Table 23E-16: Cumulative Operational PRow and Open Space Assessments

PROJECT	DESCRIPTION OF EFFECT	IMPACT OF MAGNITUDE IMAGNITUDE E OF IMPACT	SENSITIVITY OF RECEPTOR	EFFECT AND SIGNIFICANCE
H2TeessideThe Proposed Development	Permanent loss of 18,615 m ² at Cowpen Bewley Woodland Park, which represents 6.2% of the park's total size. Replacement land will be developed at Cowpen Bewley Woodland Park (20,234 m ² , or 6.7% of the park's total size). This will be replanted with woodland, however, this will be in a different location, north of the A1185. The replacement land will be planted after the end of the construction phase. The temporary land loss of 37,531 m ² of land, equivalent to 5.8% of the site at Coatham Marsh, will be restored to its original state at the end of the construction phase.	Low	Medium	Negligible (Not Significant)
HyGreen	The only location where a PRow crosses the redline boundary is along the A1085, where the Teesdale Way runs along the northern side of the A1085 just to the south of the Steel Works roundabout. However, no permanent impacts are proposed to the highway in this location.	Negligible Very Low	Medium	Negligible (Not Significant)
Net Zero Teesside	Not assessed	N/A	N/A	N/A

23E.5.7 In both the assessment for the Proposed Development and HyGreen, the sensitivity of the receptors is assessed to be medium, which infers that the receptors may be somewhat vulnerable to any changes. Given this, the cumulative sensitivity of the receptors is also assessed to be **Medium**.

23E.5.8 Both the Proposed Development and HyGreen assess their effects on this receptor. In HyGreen, it is concluded that there is a negligible magnitude of effects, because there is the minimal disruption caused in the operational phase, and there is ~~minimal~~no land take. There is land take in the assessment of effects for the Proposed Development; however, this is ~~somewhat~~ mitigated somewhat by the replacement land which will be installed in Cowpen Bewley Woodland Park. Given these assessments, the cumulative magnitude is assessed to be **Low**.

23E.5.9 As a result, the cumulative effect on PRoW and Open Space receptors is **Minor Adverse (Not Significant)**.

Private Assets (Residential and Business Premises)

23E.5.10 The following assessment of private asset effects were made by the respective socio-economics and land use chapters for the three cumulative projects, see Table 23E-17.

Table 23E-17: Cumulative Operational Private Assets Assessments

PROJECT	DESCRIPTION OF EFFECT	IMPACT OF MAGNITUDE <u>MAGNITUDE</u> <u>OF IMPACT</u>	SENSITIVITY OF RECEPTOR	EFFECT AND SIGNIFICANCE
H2Teesside <u>The Proposed Development</u>	There are no residential properties within the boundary of the Proposed Development Site, but many businesses lie close by. No occupied business premises are impacted throughout the Development Site or along the connection corridors. Most of the operational activity takes place along existing infrastructure in	Low	Low	Negligible (Not Significant)

PROJECT	DESCRIPTION OF EFFECT	IMPACT OF MAGNITUDE MAGNITUDE OF IMPACT	SENSITIVITY OF RECEPTOR	EFFECT AND SIGNIFICANCE
	heavily industrialised sites. Where permanent acquisition and rights have been sought, these are predominantly in areas using existing apparatus or have low impact on business landowners. Furthermore, the operational activities of the site are not likely to cause disruption to socio-economic activities for residents and business owners in private assets.			
HyGreen	The operational activities of the site are not likely to cause disruption to socio-economic activities for business owners and employees of these businesses.	Low	Medium	Minor Adverse (Not Significant)
Net Zero Teesside	Not assessed	N/A	N/A	N/A

23E.5.11 For the period 2030 to 2047, when all three cumulative projects overlap, both the Proposed Development and HyGreen lead to minor disruption for businesses, and the Proposed Development leads to minor disruption for residents. There is no land take reported through both of these assessments. In this phase, there is potential for combined effects from an overlap of receptors, however the scope for this is minimal given that there is no land take. Therefore, the cumulative magnitude of this impact is **Low**.

23E.5.12 In terms of sensitivity, this is assessed as low in the Proposed Development and medium in HyGreen. Taking a worst-case scenario for this receptor, the receptors for private assets are likely to be vulnerable to any changes across the Middlesbrough and Stockton TTWA for all three cumulative projects. Therefore, the cumulative sensitivity is assessed to be **Medium** for this receptor.

23E.5.13 As a result, the cumulative effect on Private Assets in this phase is assessed to be **Minor Adverse (Not Significant)**.

Development Land

23E.5.14 The following assessment of development land effects were made by the respective socio-economics and land use chapters for the three cumulative projects.

Table 23E-18: Cumulative Operational Development Land Assessments

PROJECT	DESCRIPTION OF EFFECT	<u>IMPACT</u> MAGNITUDE OF MAGNITUDE <u>IMPACT</u>	SENSITIVITY OF RECEPTOR	EFFECT AND SIGNIFICANCE
H2TeessideThe Proposed Development	Minimal disruption, no land take. To account for a COMAH installation at the site, there is mitigation of a COMAH Safety Report to reduce any risks to ALARP.	Low	Medium	Minor Adverse (Not Significant)
HyGreen	Disruption is expected to be minimal, and does not interfere with the viability of these sites. No land take is expected.	Low	Medium	Minor Adverse (Not Significant)
Net Zero Teesside	Not assessed.	N/A	N/A	N/A

23E.5.15 Both the Proposed Development and HyGreen assess the effect on this receptor. In both assessments, it is concluded that there is a low magnitude of effects. This is because there is the minimal disruption caused, and there is no land take. In the Proposed Development, there is also the consideration of COMAH installations at the site, which will be mitigated by the production of a COMAH Safety Report to reduce any risks in the operational phase. Given that there is no land take, and COMAH risks are controlled for in this stage, the cumulative magnitude is **Low**.

23E.5.16 The sensitivity of this receptor is medium in both the Proposed Development and HyGreen as a result of the close location of these receptors, and the ability of the receptor to experience disruption without a change to the economic viability of the

development land. Given this, the cumulative sensitivity is also considered **Medium** for this assessment.

23E.5.17 As a result, the cumulative effect is **Minor Adverse (Not Significant)**.

Demand for GP Surgeries

23E.5.18 The following assessment of effects on GP surgeries were made by the respective human health chapters for the three cumulative projects, as shown in Table 23E-19.

Table 23E-19: Cumulative Operational GP and Surgeries Assessment

Project	Description of effect	Impact of Magnitude	Sensitivity of receptor	Effect and significance
H2TeessideThe Proposed Development	Limited impacts to GP access due to small proportion of operation workers who may move into the area.	Negligible	Medium	Negligible (Not Significant)
HyGreen	Limited impacts to GP access due to small proportion of operation workers who may move into the area.	Negligible	Medium	Negligible (Not Significant)
Net Zero Teesside	Not assessed	N/A	N/A	N/A

23E.5.19 Although the impact on GP surgeries was not assessed for [Net Zero TeessideN2T](#), at the operational period peak, when all projects overlap between 2030 and 2047, it is estimated that there will be 231 net operational workers across the three sites. These workers may place extra demand on GP surgeries if they move to the area.

23E.5.20 It is likely that the majority of operational jobs will be taken by residents living inside of the Middlesbrough and Stockton TTWA and so there will be minimal additional demand placed on health and social care services around the three cumulative projects. Therefore, the cumulative magnitude of impact is assessed as **Very Low**.

23E.5.21 Given the factors detailed in Section 23E.4.51 for the construction cumulative assessment of effects on GP and surgeries, the same assumptions have been used to assess the operational phase sensitivity. Therefore, the cumulative sensitivity of this receptor is **Medium**.

23E.5.22 Given these factors, the cumulative effect on demand for GP surgeries is **Negligible (Not Significant)**.

23E.6 Summary of Effects from the Three Cumulative Projects

23E.6.1 The following table provides a summary of the cumulative effects of the three projects assessed within this appendix.

Table 23E-20: Summary of Cumulative Effects

DESCRIPTION OF EFFECT/RECEPTOR	MAGNITUDE OF IMPACT	SENSITIVITY OF RECEPTOR	CLASSIFICATION OF CUMULATIVE EFFECT	ADDITIONAL MITIGATION MEASURES
Construction				
Employment	High	High	Major Beneficial (Significant)	Not required.
Local housing market and tourist accommodation	High	Medium	Moderate Adverse (Significant)	The Applicant is committed to working with the promoters of other cumulative schemes to mitigate and reduce the effect of the cumulative construction workforce as far as possible. This includes setting up a working group for the Proposed Development and other cumulative developments in order to communicate and co-ordinate construction works at the individual developments in order to reduce any issues created by the additional construction workforce in the vicinity of the respective cumulative developments.
Skills and training	Low	Medium	Minor Beneficial (Not Significant)	Not required.
Agricultural and industrial land	Low	Medium	Minor Adverse (Not Significant)	Not required.
PRoW and Open Space	Low	Medium	Minor Adverse (Not Significant)	Not required.
Private assets	Medium	Medium	Moderate Adverse (Significant)	The Applicant is committed to working with the promoters of other cumulative schemes to mitigate and reduce the effect of the cumulative construction workforce as far as possible. This includes setting up a working group for the Proposed

DESCRIPTION OF EFFECT RECEPTOR	MAGNITUDE OF IMPACT	SENSITIVITY OF RECEPTOR	CLASSIFICATION OF CUMULATIVE EFFECT	ADDITIONAL MITIGATION MEASURES
				Development and other cumulative developments in order to communicate and co-ordinate construction works at the individual developments in order to reduce any issues created by the additional construction workforce in the vicinity of the respective cumulative developments.
Education and community facilities	Low	Low	Minor Adverse (Not Significant)	Not required.
Development land	Low	Medium	Minor Adverse (Not Significant)	Not required.
Demography and community disruption	Low	Medium	Minor Adverse (Not Significant)	Not required.
Demand for GP surgeries	Low	Medium	Minor Adverse (Not Significant)	Not required.
Operation (and maintenance for HyGreen)				
Employment	Medium	Medium	Moderate Beneficial (Significant)	Not required.
PRoW and Open Space	Low	Medium	Minor Adverse (Not Significant)	Not required.
Private assets	Low	Medium	Minor Adverse (Not Significant)	Not required.

DESCRIPTION OF EFFECT RECEPTOR	MAGNITUDE OF IMPACT	SENSITIVITY OF RECEPTOR	CLASSIFICATION OF CUMULATIVE EFFECT	ADDITIONAL MITIGATION MEASURES
Development land	Low	Medium	Minor Adverse (Not Significant)	Not required.
Demand for GP surgeries	Very Low	Medium	Negligible (Not Significant)	Not required.

23E.7 References

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