



Peak Cluster

Environmental Impact Assessment – Scoping Report Volume 1

Document Reference: DOC-W05-014-Final

Planning Inspectorate Reference: EN0710001



Applicant: Peak Cluster Ltd

January 2026



Prepared by:

ARUP and AECOM

© *All rights reserved.*

Table of Contents

1.	Peak Cluster - Introduction	1
1.1	Background.....	1
1.2	Overview of the Wider Scheme	1
1.3	Requirement for a Development Consent Order.....	5
1.4	Requirement for Environmental Impact Assessment	5
1.5	Marine Licence	5
1.6	The Applicant	5
1.7	The Scoping Report.....	6
1.8	References	9
2.	Legislation and Planning Policy	10
2.1	Introduction	10
2.2	Legislation.....	10
2.3	National Planning Policy	12
2.4	UK Marine Policy Statement	14
2.5	National Planning Policy Framework	14
2.6	Local Planning Policy – Local Development Plans	15
2.7	References	16
3.	The Proposed Development.....	18
3.1	Overview.....	18
3.2	Description of the Proposed Development.....	18
3.3	Rochdale Envelope and Design Parameters	39
3.4	Design Evolution and consideration of alternatives	40
3.5	References	44
4.	EIA Approach and Methodology	45
4.1	Introduction	45
4.2	Stakeholder Engagement and Consultation.....	45
4.3	Scoping Boundary	48
4.4	Approach to Environmental Impact Assessment.....	52
4.5	Assessment of Impacts.....	54
4.6	Approach to Mitigation	58
4.7	Evaluate and Assess Residual Significance	59
4.8	Transboundary Effects	59
4.9	Cumulative Effects	59
4.10	Competent Experts	59
4.11	References	60
5.	Air Quality.....	61
5.1	Introduction	61
5.2	Legislation, Policy and Guidance.....	61
5.3	Defining the Study Area	67
5.4	Baseline Environment.....	67
5.5	Identification of Potential Effects	75
5.6	Scope and Methodology	75
5.7	Planned Surveys.....	83
5.8	Mitigation	83

5.9	Summary	83
5.10	References	84
6.	Biodiversity	87
6.1	Introduction	87
6.2	Legislation, Policy and Guidance	88
6.3	Defining the Study Area	89
6.4	Baseline Environment	90
6.5	Aquatic Ecology Baseline	131
6.6	Identification of Potential Effects	135
6.7	Scope and Methodology	136
6.8	Planned Surveys	143
6.9	Mitigation	153
6.10	Habitats Regulations Assessment	153
6.11	Biodiversity Net Gain	154
6.12	Summary	155
6.13	References	155
7.	Landscape and Visual	157
7.1	Introduction	157
7.2	Legislation, Policy and Guidance	158
7.3	Defining the Study Area	162
7.4	Baseline Environment	163
7.5	Identification of Potential Effects	174
7.6	Scope and Methodology	175
7.7	Planned Surveys	192
7.8	Mitigation	192
7.9	Summary	193
7.10	References	209
8.	Traffic and Movement	215
8.1	Introduction	215
8.2	Legislation, Policy and Guidance	215
8.3	Defining the Study Area	218
8.4	Baseline Environment	219
8.5	Identification of Potential Effects	227
8.6	Scope and Methodology	228
8.7	Assumptions and limitations	236
8.8	Summary of issues to be scoped in/out	236
8.9	Planned Surveys	240
8.10	Management	241
8.11	Summary	241
8.12	References	241
9.	Noise and Vibration	243
9.1	Introduction	243
9.2	Legislation, Policy and Guidance	243
9.3	Defining the Study Area	245
9.4	Baseline Environment	246

9.5	Identification of Potential Effects	249
9.6	Scope and Methodology	250
9.7	Planned Surveys.....	257
9.8	Mitigation	258
9.9	Summary	258
9.10	References	259
10.	Historic Environment	263
10.1	Introduction	263
10.2	Legislation, Policy and Guidance	263
10.3	Defining the Study Area	265
10.4	Baseline Environment.....	266
10.5	Planned Surveys.....	267
10.6	Identification of Potential Effects	268
10.7	Scope and Methodology	270
10.8	Summary	276
10.9	References	277
11.	Water Environment and Flood Risk	280
11.1	Introduction	280
11.2	Legislation, Policy and Guidance	280
11.3	Defining the Study Area	282
11.4	Baseline Environment.....	282
11.5	Identification of Potential Effects	306
11.6	Mitigation	308
11.7	Summary	309
11.8	Scope and Methodology	309
11.9	Planned Surveys.....	321
11.10	References	321
12.	Marine Environment	326
12.1	Introduction	326
12.2	Marine Ecology	327
12.3	Marine Archaeology	333
12.4	Physical Processes.....	336
12.5	Marine Transport and Navigation	339
12.6	References	342
13.	Geology and Ground Conditions	345
13.1	Introduction	345
13.2	Legislation, Policy and Guidance	345
13.3	Defining the Study Area	346
13.4	Baseline Environment.....	347
13.5	Planned Surveys.....	365
13.6	Identification of Potential Effects	367
13.7	Scope and Methodology	368
13.8	Mitigation	382
13.9	Summary	383
13.10	References	383

14.	Socio-Economics	387
14.1	Introduction	387
14.2	Legislation, Policy and Guidance	388
14.3	Defining the Study Area	388
14.4	Baseline Environment	389
14.5	Identification of Potential Effects	401
14.6	Planned Surveys	405
14.7	Scope and Methodology	405
14.8	Assumptions and Limitations	409
14.9	Conclusion	410
14.10	References	410
15.	Human Health	413
15.1	Introduction	413
15.2	Legislation, Policy and Guidance	413
15.3	Defining the Study Area	415
15.4	Baseline Environment	416
15.5	Identification of Potential Effects	431
15.6	Scope and Methodology	432
15.7	Planned Surveys	444
15.8	Mitigation	444
15.9	Summary	444
15.10	References	445
16.	Materials and Waste	447
16.1	Introduction	447
16.2	Legislation, Policy and Guidance	447
16.3	Defining the Study Area	448
16.4	Baseline Environment	450
16.5	Scope and Methodology	460
16.6	Mitigation	471
16.7	Summary	473
16.8	References	473
17.	Climate Change	476
17.1	Introduction	476
17.2	Legislation, Policy and Guidance	476
17.3	Defining the Study Area	477
17.4	Baseline Environment	478
17.5	Planned Surveys	479
17.6	Identification of Potential Effects	479
17.7	Scope and Methodology	483
17.8	Mitigation	496
17.9	Summary	497
17.10	References	497
18.	Major Accidents and Disasters	500
18.1	Introduction	500
18.2	Legislation, Policy and Guidance	501

18.3	Defining the Study Area	502
18.4	Baseline Environment.....	503
18.5	Planned Surveys.....	509
18.6	Identification of Potential Effects.....	509
18.7	Scope and Methodology	509
18.8	Summary	530
18.9	References	530
19.	Cumulative Effects.....	532
19.1	Introduction.....	532
19.2	Approach to Cumulative Assessment	532
19.3	Initial Screening of Other Development Projects and Allocations (Stage 1).....	535
19.4	Interaction with Wider Scheme	536
19.5	References	536
20.	Summary and Next Steps.....	537
20.1	Summary	537
20.2	Proposed Structure of the Environmental Statement.....	537
20.3	Next Steps	540

Appendices

Appendix A – Abbreviations and Glossary of Key Terms

Appendix B – Supporting Figures

Appendix C – Transboundary Effects

Appendix D – Ancient Woodland

Appendix E – Aquatic Ecology EA Data Gap Analysis

Appendix F – Landscape Character Summary

Appendix G – Representative Views

Appendix H – Historic Environment Baseline Tables

Appendix I – Cumulative Effects Assessment Long List

Tables

Table 1-1: Compliance with PINS Advice Note 7	6
Table 2-1: Status of Emerging Plans	16
Table 4-1: Pipeline Sections used in Scoping Report.....	50
Table 4-2: Impact Definition.....	54
Table 4-3: Impact Magnitude Criteria.....	55
Table 4-4: Sensitivity Criteria	55
Table 4-5: Significance of Effect Matrix	57
Table 4-6: Generic Significant Effect Descriptions	57
Table 5-1: Legislation Relating to the Air Quality Assessment.....	61
Table 5-2: National Policy and Guidance Relating to the Air Quality Assessment	61
Table 5-3: Local Policy and Guidance Relating to the Air Quality Assessment.....	62

Table 5-4: Standards and Guidance Relevant to the Air Quality Assessment	63
Table 5-5: National Air Quality Standards.....	64
Table 5-6: EALs Relevant to the Assessment.....	65
Table 5-7: Air Quality Baseline Environment – Breedon Capture Facility	69
Table 5-8: Air Quality Baseline Environment – Tarmac and Buxton Lime Capture Facilities	71
Table 5-9: Air Quality Baseline Environment Holcim Capture Facility.....	73
Table 5-10: Air Quality Scope – Capture Facilities	79
Table 5-11: Air Quality Scope – Peak Cluster Pipeline	80
Table 5-12: Air Quality Scope – Coastal AGI to MLWS Pipeline(s).....	81
Table 6-1: Legislation Relevant to Biodiversity	88
Table 6-2: Planning Policy Relevant to Biodiversity	89
Table 6-3: Relevant Standards and Guidance	89
Table 6-4: Biodiversity Baseline Environment – Breedon Capture Facility	91
Table 6-5: Biodiversity Baseline Environment – Holcim Capture Facility.....	98
Table 6-6: Biodiversity Baseline – Tarmac and Buxton Lime Capture Facilities	101
Table 6-7: Biodiversity Baseline - Pipeline.....	106
Table 6-8: Notable species identified within the Aquatic Desk Study Area	132
Table 6-9: Effect Classification Descriptions.....	138
Table 6-10: Biodiversity Scope – Capture Facilities	140
Table 6-11: Biodiversity Scope – Peak Cluster Pipeline	141
Table 6-12: Biodiversity Scope – Coastal AGI to MLWS Pipeline(s).....	142
Table 6-13: Scope of Proposed Development's Biodiversity Surveys	146
Table 7-1: Legislation Relevant to Landscape and Visual Amenity	158
Table 7-2: National Planning Policy Relevant to Landscape and Visual.....	159
Table 7-3: Local Planning Policy Relevant to Landscape and Visual	160
Table 7-4: Relevant Standards and Guidance	161
Table 7-5: LVIA Study Area.....	163
Table 7-6: Local Landscape Designations.....	164
Table 7-7: Visual Receptors	173
Table 7-8: Establishing Landscape Value Criteria	179
Table 7-9: Considerations for Landscape Susceptibility	181
Table 7-10: Landscape Susceptibility Criteria.....	183
Table 7-11: Sensitivity of Landscape Receptors Criteria	183
Table 7-12: Magnitude of Landscape Impacts Criteria	185
Table 7-13: Value Attached to the Views Criteria.....	187
Table 7-14: Susceptibility of Visual Receptors Criteria	188
Table 7-15: Sensitivity of Visual Receptors Criteria	188
Table 7-16: Magnitude of Visual Impacts Criteria	190
Table 7-17: Significance of Landscape and Visual Effects	191
Table 7-18: Landscape and Visual Scope - Capture Facilities (Breedon Capture Facility, Tarmac Capture Facility, Buxton Lime Capture Facility, Holcim Capture Facility).....	194
Table 7-19: Landscape and Visual Scope – Above Ground Infrastructure (North Feeder AGI).....	196
Table 7-20: Landscape and Visual Scope – Above Ground Infrastructure (Central Feeder AGI, Connection AGI 1 and Connection AGI 2 and AGI 3).....	198
Table 7-21: Landscape and Visual Scope – Peak Cluster Pipeline (Central)	200
Table 7-22: Landscape and Visual Scope – Peak Cluster Pipeline (East).....	202
Table 7-23: Landscape and Visual Scope - Peak Cluster Pipeline (West) and Coastal AGI to MLWS Pipeline(s).....	204
Table 7-24: Landscape and Visual Scope – Coastal AGI	206

Table 8-1: Traffic and Movement - Legislation	215
Table 8-2: Traffic and Movement - Policy	216
Table 8-3: Traffic and Movement – Standards and Guidance.....	218
Table 8-4: Traffic and Movement – Breedon Capture Facility	220
Table 8-5: Traffic and Movement Baseline – Tarmac Capture Facility and Buxton Lime Capture Facility.....	222
Table 8-6: Traffic and Movement Baseline – Holcim Capture Facility	223
Table 8-7: Traffic and Movement Baseline – Peak Cluster Pipeline (East).....	225
Table 8-8: Traffic and Movement Baseline – Peak Cluster Pipeline (Central)	226
Table 8-9: Traffic and Movement Baseline – Peak Cluster Pipeline (West).....	226
Table 8-10: Traffic and Movement Baseline – Coastal AGI to MLWS Pipeline(s) ...	227
Table 8-11: Sensitivity of Receptors	230
Table 8-12: Magnitude of Impact	233
Table 8-13: Magnitude of Impact	234
Table 8-14: Classification of Effects.....	235
Table 8-15: Traffic and Transport – Capture Facilities	237
Table 8-16: Traffic and Transport Scope – Peak Cluster Pipeline and Coastal AGI to MLWS Pipeline(s).....	239
Table 9-1: Legislation Relevant to Noise and Vibration	243
Table 9-2: Planning Policy Relevant to Noise and Vibration	243
Table 9-3: Standards and Guidance	244
Table 9-4: Noise and Vibration Study Areas	245
Table 9-5: Noise and Vibration Environment – Breedon Capture Facility	246
Table 9-6: Noise and Vibration Baseline Environment – Tarmac Capture Facility ..	247
Table 9-7: Noise and Vibration Baseline Environment – Buxton Lime Capture Facility	247
Table 9-8: Noise and Vibration Baseline Environment – Holcim Capture Facility ...	247
Table 9-9: Noise and Vibration Baseline Environment – Pipeline East.....	247
Table 9-10: Noise and Vibration Baseline Environment – Pipeline Central	248
Table 9-11: Noise and Vibration Baseline Environment – Pipeline West	248
Table 9-12: Noise and Vibration Baseline Environment – Coastal AGI to MLWS Pipeline(s)	249
Table 9-13: Noise and Vibration Baseline Environment – Coastal AGI.....	249
Table 9-14: Magnitude of impact of construction noise at residential receptors	252
Table 9-15: Magnitude of impact of human response to construction vibration (including tunnelling) at residential receptors	253
Table 9-16: Magnitude of impact of structural damage due to construction vibration	253
Table 9-17: Magnitude of impact of construction road traffic noise	253
Table 9-18: Magnitude of impact – residential site suitability	254
Table 9-19: Magnitude of impact – operational road traffic noise	254
Table 9-20: Noise and Vibration Scope – Capture Facilities.....	256
Table 9-21: Noise and Vibration Scope – Peak Cluster Pipeline	256
Table 9-22: Noise and Vibration Scope – Coastal AGI to MLWS Pipeline(s).....	257
Table 10-1: Relevant Legislation	263
Table 10-2: Relevant National Policies, Plans and Strategies	264
Table 10-3: Relevant Local Policy	264
Table 10-4: Standards and Guidance	264
Table 10-5: Scope of Proposed Development Surveys	267
Table 10-6: Criteria for Determining the Value of Heritage Assets.....	271
Table 10-7: Criteria for Determining the Magnitude of Impact	272
Table 10-8: Historic Environmental Scope – Above Ground Components.....	274

Table 10-9: Historic Environment Scope – Below Ground Components.....	275
Table 11-1: Relevant Legislation for Water Environment.....	280
Table 11-2: Relevant National Planning Policy	281
Table 11-3: Relevant Guidance	281
Table 11-4: Water Environment and Flood Risk Baseline Environment – Breedon Capture Facility	283
Table 11-5: Water Environment and Flood Risk Baseline Environment – Tarmac Capture Facility	286
Table 11-6: Water Environment and Flood Risk Baseline Environment – Buxton Lime Capture Facility	289
Table 11-7: Water Environment and Flood Risk Baseline Environment – Holcim Capture Facility	291
Table 11-8: Water Environment and Flood Risk Baseline Environment – Peak Cluster Pipeline (East).....	294
Table 11-9: Water Environment and Flood Risk Baseline Environment – Peak Cluster Pipeline (Central)	297
Table 11-10: Water Environment and Flood Risk Baseline Environment – Peak Cluster Pipeline (West).....	301
Table 11-11: Water Environment and Flood Risk Baseline Environment - Coastal AGI to MLWS Pipeline(s).....	304
Table 11-12: Importance of Water Receptors	312
Table 11-13: Criteria for Determining the Magnitude of Impacts.....	315
Table 11-14: Significance Matrix (adapted from LA 104 Environmental Assessment and Monitoring (Ref 11-47)).....	316
Table 11-15: Water Environment and Flood Risk Scope – Capture Facilities.....	317
Table 11-16: Water Environment and Flood Risk Scope – Peak Cluster Pipeline and Coastal AGI to MLWS Pipeline(s).....	318
Table 13-1: European and National Legislation.....	345
Table 13-2: National Planning Policy	346
Table 13-3: Relevant Standards and Guidance	346
Table 13-4: Geology and Ground Conditions Baseline Environment – Breedon Capture Facility	347
Table 13-5: Geology and Ground Conditions Baseline Environment – Tarmac and Buxton Lime Capture Facility	350
Table 13-6: Geology and Ground Conditions Baseline Environment – Holcim Capture Facility	353
Table 13-7: Geology and Ground Conditions Baseline Environment – Peak Cluster Pipeline (East).....	355
Table 13-8: Geology and Ground Conditions Baseline Information – Peak Cluster Pipeline (Central)	358
Table 13-9: Geology and Ground Conditions Baseline Environment – Peak Cluster Pipeline (West).....	361
Table 13-10: Geology and Ground Conditions Baseline Environment: Coastal AGI to MLWS Pipeline(s).....	363
Table 13-11: Scope of Proposed Development Surveys	366
Table 13-12: Magnitude of Impact	370
Table 13-13: Receptor Sensitivity	375
Table 13-14: Significance Matrix	377
Table 13-15: Geology and Ground Conditions Scope Summary – Capture Facilities	378
Table 13-16: Geology and Ground Conditions Scope Summary – Peak Cluster Pipeline and Coastal AGI to MLWS Pipeline(s)	380

Table 14-1: Legislation Relevant to Socio-economics	388
Table 14-2: Planning Policy Relevant to Socio-economics	388
Table 14-3: Relevant standards and guidance	388
Table 14-4: Receptor Types and the Associated Geographical Area for Direct and Indirect Effects.....	389
Table 14-5: Elements of the Proposed Development and the Associated Geographical Areas.....	390
Table 14-6: Geographical Areas by Population (Ref 14-16)	391
Table 14-7: Local Authorities within the Study Area by Average IMD Score Rank and Proportion of LSOAs Within the Most Deprived 10% Nationally (Ref 14-17).....	393
Table 14-8: Geographical areas by economic activity and unemployment rate (Ref 14-15).....	396
Table 14-9: Geographical Areas Within the Study Area by Day and Overnight Visits and Total Spend (Ref 14-15)	396
Table 14-10: Geographical Areas by Employment in the Tourism Industry: Absolute Employment and as a Proportion of Total Employment (Ref 14-15).....	397
Table 14-11: Total Bedspace Stock by Geographical Area and Accommodation Type (Ref 14-21).....	398
Table 14-12: Geographical Areas Within the Study Area by Projected Population Change from 2022 to 2047 – Total and by Age Group (Ref 14-19)	399
Table 14-13: Overview of Potential Impacts	402
Table 14-14: Sensitivity of receptors.....	406
Table 14-15: Magnitude of impact	406
Table 14-16: Significance of Impact	407
Table 14-17: Classification of Effects.....	407
Table 14-18: Proposed Scope of Socio-economics Assessment.....	408
Table 15-1: Legislation and Policy Relevant to Human Health	413
Table 15-2: Guidance Relevant to Human Health	413
Table 15-3: Study Area	416
Table 15-4: Human Health Baseline Environment - Breedon Capture Facility	417
Table 15-5: Human Health Baseline Environment - Tarmac Capture Facility	419
Table 15-6: Human Health Baseline Environment - Buxton Lime Capture Facility ..	422
Table 15-7: Human Health Baseline Environment- Holcim Capture Facility	423
Table 15-8: Human Health Baseline Environment - Peak Cluster Pipeline (East) ..	425
Table 15-9: Human Health Baseline Environment - Peak Cluster Pipeline (Central)	427
Table 15-10: Human Health Baseline Environment - Peak Cluster Pipeline (West) and Coastal AGI to MLWS Pipeline	429
Table 15-11: Human Health Sensitivity Criteria	436
Table 15-12 Human Health Magnitude Impact Criteria.....	437
Table 15-13 Human Health Significance of Effect	438
Table 15-14: Human Health Scope- Capture Facilities.....	438
Table 15-15: Human Health Scope- Peak Cluster Pipeline and Coastal AGI to MLWS Pipeline(s)	440
Table 16-1: Legislation relevant to Materials and Waste	447
Table 16-2: National Planning Policy relevant to Materials and Waste	448
Table 16-3: Standards and Guidance relevant to Materials and Waste	448
Table 16-4: Summary of Study Areas – Materials and Waste.....	449
Table 16-5: Regional and National Availability of Key Construction Materials	451
Table 16-6: Potential Recycle Context.....	451
Table 16-7: Permitted Waste Sites identified within or near the Proposed Development	452

Table 16-8: Historic Landfills identified within or near the Proposed Development	453
Table 16-9: Permitted Landfills identified within or near the Proposed Development	455
Table 16-10: Landfill Capacity (2024) in West Midlands, East Midlands, North West and England	456
Table 16-11: Summary of Waste Inputs by Facility (2024)	457
Table 16-12: Hazardous Waste Incineration Facilities and Cement Kilns Accepting Hazardous Waste	458
Table 16-13: Hazardous Liquid Waste Treatment Facilities in England	458
Table 16-14: Standard, Good and Best Practice Recovery Rates by Material	459
Table 16-15: Materials Receptor Sensitivity	461
Table 16-16: Inert and Non-Hazardous Landfill Capacity Sensitivity	463
Table 16-17: Hazardous Landfill Capacity Sensitivity	463
Table 16-18: Materials Magnitude of Impacts	464
Table 16-19: Inert and Non Hazardous Waste – Magnitude of Impact	465
Table 16-20: Hazardous Waste – Magnitude of Impact	465
Table 16-21: Effects Threshold	466
Table 16-22: Materials and Waste Scope	467
Table 16-23: Materials and Waste Scope – Peak Cluster Pipeline and Coastal AGI to MLWS Pipeline(s)	469
Table 17-1: Legislation Relevant to Climate Change	476
Table 17-2: National Planning Policy Relevant to Climate Change	476
Table 17-3: Standards and Guidance Relevant to Climate Change	477
Table 17-4: Lifecycle GHG Baseline Environment	478
Table 17-5: Climate Change Risk Baseline Environment	478
Table 17-6: In-Combination Climate Impact Assessment Baseline Environment	479
Table 17-7: Potential Sources of GHG Emissions from the Proposed Development	480
Table 17-8: Potential Scoped in Effects to Climate Change Risk	482
Table 17-9: UK Carbon Budgets	486
Table 17-10: IEMA Criteria Used to Determine the Significance of GHG Emissions	487
Table 17-11: Criteria Used to Determine the Likelihood of an Impact Occurring for the CCRA	490
Table 17-12: Criteria Used to Determine the Level of Consequence of a Climate Change Impact	491
Table 17-13: Climate Change Impacts Significance Matrix (Where S is Significant, and NS is Not Significant)	492
Table 17-14: Likelihood of a Climate Risk Occurring	493
Table 17-15: Level of Likelihood of an ICCI Occurring	493
Table 17-16: Consequence Criteria for an ICCI Assessment	494
Table 17-17: ICCI Significance Criteria (Where S is Significant, and NS is Not Significant)	495
Table 17-18: Climate Change Assessment Scope	496
Table 18-1: Legislation Relevant to Major Accidents and Disasters Assessment	501
Table 18-2: National Planning Policy Relevant to Major Accidents and Disasters Assessment	501
Table 18-3: Relevant Standards and Guidance	501
Table 18-4: Major Accidents and Disaster Groups and Categories	502
Table 18-5: Major Accidents and Disasters Baseline Environment - Breedon Capture Facility	504

Table 18-6: Major Accidents and Disasters Baseline Environment - Tarmac Capture Facility	504
Table 18-7: Major Accidents and Disasters Baseline Environment - Buxton Lime Capture Facility	505
Table 18-8: Major Accidents and Disasters Baseline Environment - Holcim Capture Facility	505
Table 18-9: Major Accidents and Disasters Baseline Environment - Peak Cluster Pipeline East	506
Table 18-10: Major Accidents and Disasters Baseline Environment - Peak Cluster Pipeline Central	507
Table 18-11: Major Accidents and Disasters Baseline Environment - Peak Cluster Pipeline West	507
Table 18-12: Major Accidents and Disasters Baseline Environment – Coastal AGI to MLWS Pipeline(s)	508
Table 18-13: Major Accidents and Disasters Scope and Methodology - Capture Facilities	511
Table 18-14: Major Accidents and Disasters Scope and Methodology – Peak Cluster Pipeline and Pipeline(s) from Coastal AGI to MLWS	520
Table 20-1: Proposed Structure of the ES	538

Figures

Figure 1-1: Location of the Proposed Development	3
Figure 1-2: Scoping Boundary	4
Figure 4-1: Pipeline Section Splits to be used in the PEIR and ES	51

NOTE: The full list of Figures is provided in Appendix B

Plates

Plate 3-1: Existing Breedon Hope Cement Works	19
Plate 3-2: Existing Tarmac Tunstead Cement Works	22
Plate 3-3: Existing Holcim Cauldon Cement Works	27
Plate 3-4: Diagram of Open Trench Excavation	29
Plate 3-5: Marker Post	34
Plate 3-6: Landfall and Inland Zones	35
Plate 3-10: Initial Area of Search	42
Plate 4-1: Overview of EIA Process	52
Plate 14-1: Population change by geographical area, 2014-2024 (Ref 14-16)	392
Plate 14-2: Geographical Areas by Age Profile, 2024 (Ref 14-16)	393
Plate 14-3: GVA per capita, regional and national, 2013-2023 (Ref 14-18)	394
Plate 14-4 Geographical Areas by Proportion of the Population with an NVQ of Level 4 (Degree-Level) or above and With No Qualifications (Ref 14-15)	395
Plate 14-5: Population pyramid of the local authorities within the Study Area from 2022 to 2047 (Ref 14-19)	400
Plate 15-1: Determinants of health	434
Plate 15-2: Determinants of health in neighbourhoods	435
Plate 16-1: The Waste Hierarchy – from DEFRA's guidance on Applying the Waste Hierarchy	472
Plate 17-1: Lifecycle stages of civil engineering works assessment (PAS 2080:2023)	484

Plate 19-1: Staged approach to Cumulative Assessment.....	533
Plate 20-1: Proposed Structure of the ES	538
Plate 20-2: Indicative Timeline for the EIA development and DCO Application	541

1. Peak Cluster - Introduction

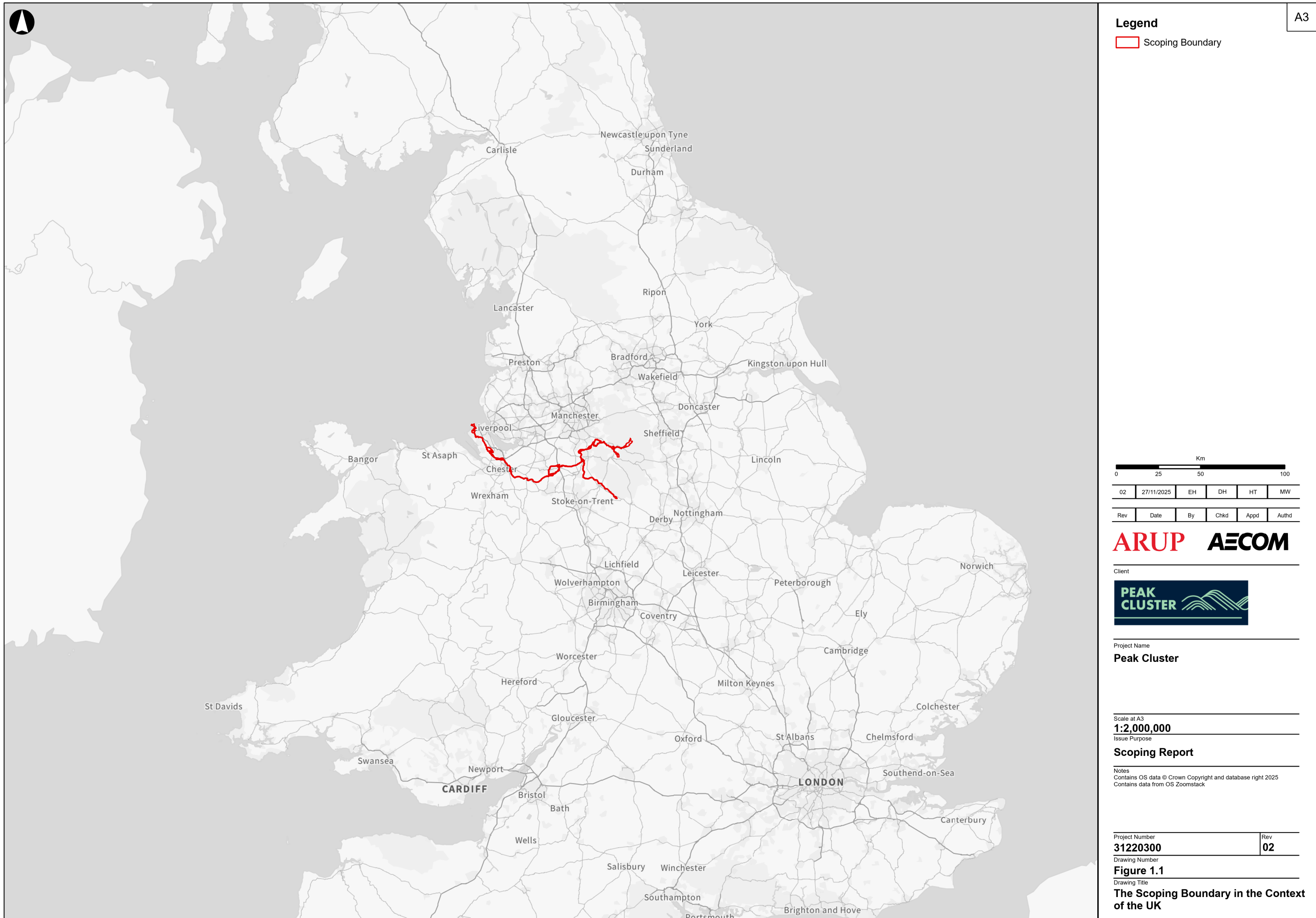
1.1 Background

- 1.1.1 Peak Cluster is an innovative collaboration to capture carbon dioxide (CO₂) emissions from cement and lime production in Derbyshire and Staffordshire and transport it by buried pipeline to the coast from where it will be transported offshore for permanent storage under the seabed.
- 1.1.2 Peak Cluster brings together four industrial manufacturers of cement and lime for the development of decarbonisation infrastructure in and around the Peak District to enable them to become a low carbon emission cluster. Peak Cluster includes Tarmac Cement Limited (Tarmac), Breedon Cement Limited (Breedon), Buxton Lime Limited (Buxton Lime), and Holcim UK Ltd (Holcim). These organisations have come together with Progressive Energy, Summit Energy Evolution and the National Wealth Fund to form Peak Cluster Limited. Peak Cluster will demonstrate how the UK's industries can decarbonise, putting the UK on the path to net zero whilst safeguarding and creating jobs.
- 1.1.3 Tarmac, Breedon, Buxton Lime, and Holcim produce 40% of the UK's cement and lime in their manufacturing sites which are part of Peak Cluster. These materials are of national significance for underpinning the construction and manufacturing industry, providing raw materials for roads, buildings and railways. Lime is also a fundamental ingredient for many UK industries, including drinking water purification, environmental remediation, and sugar manufacturing. It is important to ensure the secure and long-term domestic supply of cement and lime whilst also safeguarding jobs.
- 1.1.4 In the production of lime and cement, most of the carbon dioxide (CO₂) that is generated is a direct consequence of processing the limestone raw material through calcination (the process of heating a substance to a high temperature in the absence of oxygen). Alternatives, such as switching the type of fuel used in the process, only offer a marginal reduction in emissions. Hence, CO₂ emissions can only be substantially abated by Carbon Capture and Storage (CCS) in combination with other techniques.
- 1.1.5 Peak Cluster aims to reduce annual carbon emissions from its partners by 3 Million Tonnes Per Annum (MTPA) from the early 2030s (25% of total annual CO₂ emissions for Derbyshire and Staffordshire), by capturing CO₂ from the plants and transporting it by pipeline for permanent storage under the sea bed in Spirit Energy's Morecambe Net Zero's (MNZ) carbon store.
- 1.1.6 The Peak Cluster Limited proposals (hereafter referred to as the Proposed Development) are to construct Capture Facilities, and a CO₂ pipeline to Mean Low Water Springs (MLWS) along with required above ground installations (AGI). The location of the Proposed Development in the context of the U.K. is shown on Figure 1-1. Consenting of the Proposed Development is being managed and delivered by Peak Cluster Limited. Spirit Energy are responsible for the construction of all elements of the Proposed Development upstream of the Coastal AGI, along with developing the offshore components required as part of the wider scheme.

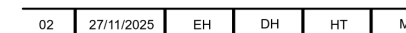
1.2 Overview of the Wider Scheme

- 1.2.1 As part of their commitments to tackling climate change, the UK government has set legally binding targets to become net zero in all greenhouse gases by 2050 for England and Wales.

- 1.2.2 The UK Government clearly recognises the key role which Carbon Capture Usage and Storage (CCUS) can play in achieving its climate goals and moving the UK toward transitioning to a low-carbon economy. The government is looking to support the development of CCUS technologies across a range of sectors with structured programmes of investments. The UK government has focused investments on industrial clusters which provide the optimum way of capturing carbon dioxide and removing it permanently from the atmosphere. Around the UK there are seven proposed major industrial clusters which are responsible for around 50% of the UK's emissions. Clustering allows industries to share the transport and storage infrastructure, which increases the total amount of Carbon Dioxide captured and stored, reduces the cost per tonne, thus reducing the cost and risk of attempting to develop these systems in isolation.
- 1.2.3 The wider scheme is made up of two key parts:
- **the Proposed Development** –the onshore capture and transportation system comprises four carbon capture facilities, the Peak Cluster pipeline and required Above Ground Installations (AGI), a Coastal AGI and further pipeline(s) traveling from the Coastal AGI to MLWS. The extent of the Proposed Development ends where the pipeline reaches the MLWS. This is the focus of this Scoping Report and for what the subject of the Development Consent Order (DCO) Application will be made. The Scoping Boundary is presented within Figure 1.2 and further details are provided within Chapter 3; and
 - **Morecambe Net Zero** – a project under development by Spirit Energy, is Peak Cluster's storage partner. This project is converting the depleted South and North Morecambe gas fields into CO₂ storage sites. Once operational, it will become one of the UK's biggest carbon storage hubs, capable of storing up to 1 gigatonne of CO₂, equivalent to three years of current UK carbon emissions (Ref 1-1). The UK North Sea Transition Authority (NSTA) granted the carbon storage licence (CS010) to Spirit Energy in May 2023. Spirit Energy is now undertaking the programme of work agreed with NSTA towards award of its storage permit. MNZ will be the store for CO₂ captured and transported by Peak Cluster. MNZ will develop and operate the transportation of CO₂ from the Coastal AGI where it will then be further transported in up to two onshore pipelines to MLWS which then continue offshore to the storage location, where additional infrastructure will be built. The Offshore Pipeline (from beyond MLWS) and the construction of other offshore infrastructure do not form part of the Proposed Development for which this Scoping Report relates. These will be consented separately.
- 1.2.4 **MNZ | Peak Cluster** is the full chain collaboration between MNZ and Peak Cluster, including the Capture Facilities.

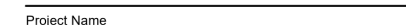


 Scoping Boundary



Rev	Date	By	Chkd	Appd	Au

Client _____



Scale at A3

Issue Purpose

Notes

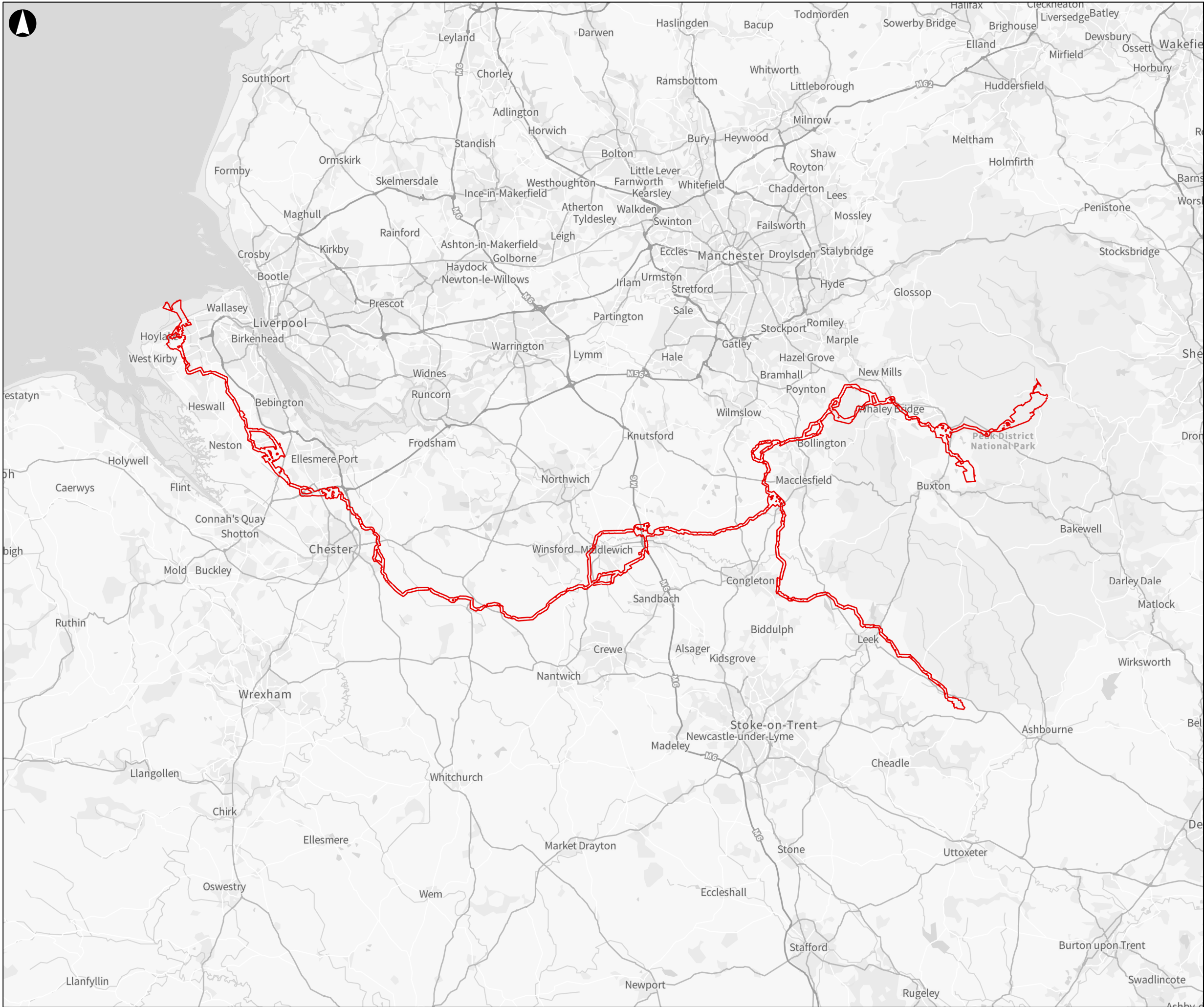
Project Number	Rev

Rev

02

Figure 1.1

The Scoping Boundary in the Context of the UK

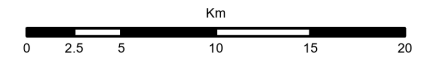


Legend

Scoping Boundary

A3

11/27/2025 9:41 AM



02	27/11/2025	EOS	DH	HT	MW

Rev	Date	By	Chkd	Appd	Authd

ARUP **AECOM**

Client



Project Name

Peak Cluster

Scale at A3

1:400,000

Issue Purpose

Scoping Report

Notes

Contains OS data © Crown Copyright and database right 2025
Contains data from OS Zoomstack

Project Number

31220300

Rev

02

Drawing Number

Figure 1.2

Drawing Title

The Scoping Boundary

1.3 Requirement for a Development Consent Order

- 1.3.1 Onshore cross-country pipelines over 16.093 km (10 miles) in length are classified as Nationally Significant Infrastructure Projects (NSIPs) under sections 14(1)(g) and 21 of the Planning Act 2008 (PA2008) and require a DCO to authorise their construction and operation. An application for DCO will be submitted to the Secretary of State for the Department for Energy Security and Net Zero (DESNZ) via the Planning Inspectorate (PINS).
- 1.3.2 The DCO application will be accompanied by an Environmental Statement (ES) prepared in accordance with the Infrastructure Planning EIA Regulations 2017.

1.4 Requirement for Environmental Impact Assessment

- 1.4.1 The Proposed Development falls under Schedule 1, paragraph 16 of the EIA Regulations 2017:
‘16. Pipelines with a diameter of more than 800 millimetres and a length of more than 40 km for the transport of–
(a) Gas, oil or chemicals;
(b) Carbon dioxide streams for the purposes of geological storage, including associated booster stations.’
- 1.4.2 The Proposed Development has not been subject to an EIA Screening Request or Opinion, as all development listed within Schedule 1 is automatically classified as EIA development under the EIA Regulations 2017.
- 1.4.3 Under Regulation 8(1)(b) of the Infrastructure Planning (Environmental Impact Assessment (EIA) Regulations 2017, notification has been submitted to the SoS along with this EIA Scoping Report, to confirm that the Applicant currently intends to submit an Environmental Statement accompanying a DCO Application during Q3 2027.

1.5 Marine Licence

- 1.5.1 The Application for a DCO for the Proposed Development will include provisions for a deemed Marine Licence (DML) from the shoreline down to MLWS. Consultation regarding the DML and any associated assessment required will be held with Marine Management Organisation (MMO) and Natural England as the EIA/DCO application progresses.

1.6 The Applicant

- 1.6.1 The Proposed Development is being developed by Peak Cluster Limited, a special purpose vehicle formed by Tarmac, Breedon, Holcim, Buxton Lime, Progressive Energy, Summit Energy Evolution and the National Wealth Fund, the UK government's principal investor and policy bank, which is investing in the Peak Cluster CCS Project. National Wealth Fund investment must help deliver the government's growth and clean energy missions, generate a return for the taxpayer and crowd in private capital.

1.7 The Scoping Report

Objective

- 1.7.1 Scoping forms a key stage of the EIA process, providing a framework for identifying likely significant environmental effects arising from the Proposed Development and distinguishing the environmental topics to be addressed within the ES.
- 1.7.2 The EIA Regulations 2017 set out the requirements for an applicant who proposes to request a scoping opinion from the SoS. Regulation 10 (3) of the EIA Regulations 2017 states that a request for a scoping opinion must include:
- A plan sufficient to identify the land;
 - A description of the proposed development, including its location and technical capacity;
 - An explanation of the likely significant effects of the development on the environment; and
 - Such other information or representations as the person making the request may wish to provide or make.
- 1.7.3 PINS Advice Note 7: Environmental Impact Assessment: Process, Preliminary Environmental Information and Environmental Statements (March 2025) provides advice on the information that should be provided in the Scoping Report. Table 1-1 identifies where the suggested content can be found within this Scoping Report.

Table 1-11: Compliance with PINS Advice Note 7

Section	Description
The Proposed Development	
Referenced plans presented at an appropriate scale to convey clearly the information and all known features associated with the Proposed Development.	Figures 1.1 and 1.2 display the Proposed Development location and Scoping Boundary. Figure 1.4 displays an overview of the key constraints in the local area. Figure 3.4 displays the key components of the Proposed Development.
An explanation of the approach to addressing uncertainty where it remains in relation to elements of the Proposed Development (e.g. design parameters)).	This is presented in Chapter 3, Section 3.4.
EIA Approach and Topic Areas	
An outline of the reasonable alternatives considered and the reasons for selecting the preferred option.	This is presented in Chapter 3 Section 3.5.
A summary table depicting each of the aspects and matters that are requested to be scoped out allowing for quick identification of issues.	Each technical chapter (5 to 19) of the Scoping Report contains a summary table identifying those topics which will be 'scoped in' and those 'scoped out' of the ES.

Section	Description
A detailed description of the aspects and matters proposed to be scoped out of further assessment with justification provided.	Summarised within each technical chapter (5 to 19).
Results of desktop and baseline studies where available and where relevant to the decision to scope in or out aspects or matters.	Information on baseline characteristics are included within Chapters 5-19.
Aspects and matters to be scoped in, the report should include details of the methods to be used to assess impacts and to determine significance of effect e.g. criteria for determining sensitivity and magnitude.	Items considered to be 'scoped in' for the purposes of the ES are identified within each of the technical chapters (5 to 19) and an overview of the assessment methodology is also provided.
Any avoidance or mitigation measures proposed, how they may be secured and the anticipated residual effects.	These details are provided within Chapters 5-19.
Information Sources	
References to any guidance and best practice to be relied upon.	Appropriate references are provided in Chapters 4-19.
Evidence of agreements reached with consultation bodies (for example the statutory nature conservation bodies or local authorities)).	Consultation is currently underway – Chapter 4 Section 4.2 provides the latest information as at the date when this document was prepared.
An outline of the structure of the proposed ES.	This is presented in Section 20.2.
Transboundary Effects	
The Applicant may also wish to provide a completed transboundary screening matrix dealing with the potential effects of the Proposed Development on other European Economic Area (EEA) States.	This is presented in Appendix B. This follows the suggested format for the transboundary screening matrix is provided in the Planning Inspectorate's Advice Note 'Transboundary Impacts and Process.

- 1.7.4 A list of useful abbreviations and a glossary of key terms is provided in Appendix A.
- 1.7.5 Figure 1-3 provides an overview of the Scoping Boundary, overlain on the Local Planning Authorities' (LPAs) administrative boundaries that may be impacted by the Proposed Development. Further information relating to the location of the Scoping Boundary is included in Section 4.3.
- 1.7.6 The aim of this document is to identify potential receptors that may be affected or impacted by the proposed development and outline the potential for likely significant environmental effects. This in turn results in the identification of the issues to be addressed in the EIA and informs the Scoping Opinion, upon which guidance the EIA will be conducted.
- 1.7.7 This document provides background information to assist the consenting authority in forming its Scoping Opinion in accordance with Regulation 15(1) of The Town and Country Planning

(Environmental Impact Assessment) (England) Regulations 2017, which came into force on 16th May 2017 (SI 2017 No.571); referred to hereafter as the 'EIA Regulations'.

Structure of this Scoping Report

- 1.7.8 Chapters 1 to 4 provide further detail on the Proposed Development, the legislative framework it falls within and the proposed approach to the EIA. Chapters 5 to 17 set out details on the environmental and social setting, the proposed scope and approach to the assessment of pertinent environmental disciplines and the initial identification of potential significant effects.
- 1.7.9 Chapter 18 provides the approach to major accidents and disasters whilst Chapter 19 provides the approach to cumulative effects assessment. Chapter 20 provides an overall summary and identifies the next steps.
- 1.7.10 In summary, the chapters of this EIA Scoping Report comprise:
- Chapter 1: Introduction;
 - Chapter 2: Legislation and Planning Policy;
 - Chapter 3: The Proposed Development;
 - Chapter 4: EIA Approach and Methodology;
 - Chapter 5: Air Quality;
 - Chapter 6: Biodiversity;
 - Chapter 7: Landscape and Visual;
 - Chapter 8: Traffic and Movement;
 - Chapter 9: Noise and Vibration;
 - Chapter 10: Historic Environment;
 - Chapter 11: Water Environment and Flood Risk;
 - Chapter 12: Marine Environment
 - Chapter 13: Geology and Ground Conditions;
 - Chapter 14: Socio-Economics;
 - Chapter 15: Human Health;
 - Chapter 16: Materials and Waste;
 - Chapter 17: Climate Change;
 - Chapter 18: Major Accidents and Disasters;
 - Chapter 19: Cumulative Effects; and
 - Chapter 20: Summary and Next Steps.
- 1.7.11 The Appendices to this EIA Scoping Report comprise:
- Appendix A – Abbreviations and Glossary of Key Terms;
 - Appendix B – Supporting Figures;
 - Appendix C – Transboundary Effects Screening;

- Appendix D – Ancient Woodland within 2km of the Pipeline Scoping Boundary;
- Appendix E – Aquatic Ecology EA Data Gap Analysis;
- Appendix F – Landscape Character Summary;
- Appendix G – Representative Viewpoint Locations;
- Appendix H – Historic Environment Baseline Tables; and
- Appendix I – Provisional Cumulative Effects Assessment Long List.

1.8 References

Ref 1-1 Department for Energy Security and Net Zero (2024) 2022 UK Greenhouse Gas Emissions, Final Figures. Available at:
<https://assets.publishing.service.gov.uk/media/65c0d15863a23d0013c821e9/2022-final-greenhouse-gas-emissions-statistical-release.pdf>

2. Legislation and Planning Policy

2.1 Introduction

- 2.1.1 This chapter provides a summary of the legislation and the national, regional and local planning policies relevant to the Proposed Development, which have been considered when defining the scope of the EIA. Where specific aspects of these policies are directly relevant to specific environmental topics, these are addressed further in Chapters 5 to 19.
- 2.1.2 The DCO application will be accompanied by a Planning Statement which will set out each relevant national, regional and local planning policy in more detail and demonstrate how the Proposed Development accords.

2.2 Legislation

The Planning Act 2008

- 2.2.1 PA2008 (Ref 2-1) provides for the development consenting regime for major infrastructure projects and sets the thresholds for which development is considered to be a Nationally Significant Infrastructure Project (“NSIP”). Consent under the PA2008 (“development consent”) is required for any development that is or forms part of an NSIP.
- 2.2.2 The Proposed Development is defined as an NSIP as set out in PA2008, Section 14(1)(g) and Section 21 as it will be a ‘cross-country’ pipeline exceeding 16.093 km in length, not for transport of air, water, water vapour or steam, promoted by a developer who is not a gas transporter
- 2.2.3 The Planning Act sets out that the relevant Secretary of State is responsible for the determination of the application for development consent, which in this case, is the Secretary of State for Energy Security and Net Zero. The Planning Inspectorate will appoint an Examining Authority to examine the application and make a recommendation to the Secretary of State as to whether to grant development consent. Since pipelines carrying carbon dioxide are considered within the scope of NPS EN-1, they therefore fall within the field of energy infrastructure.
- 2.2.4 The PA2008 is accompanied by Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended) (Ref 2-2) which transposed into UK law Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment (the EIA Directive) as it relates to projects that fall under the remit of the Act. These regulations require that EIA be undertaken, and an Environmental Statement submitted, in support of DCO applications.
- 2.2.5 The Act also enabled ‘The Infrastructure Planning (Decisions) Regulations 2010 (Ref 2-3)’, which set out regulations regarding issues which must be taken into account by decision makers in certain circumstances. Regulations 3, and 7 are relevant to the Proposed Development.
- 2.2.6 Regulation 3 states that the decision maker shall have regard to the desirability of:
- Preserving Listed Buildings or their setting or any feature of special architectural or historic interest which they possess;
 - Preserving or enhancing the character or appearance of Conservation Areas; and
 - Preserving Scheduled Monuments or their settings.

- 2.2.7 Regulation 7 states that the decision maker shall have regard to the United Nations Environment Programme Convention on Biological Diversity, one of whose objectives is the conservation of biological diversity.

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017

- 2.2.8 The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (Ref 2-2) transposed into UK law the requirements of Directive 2011/92/EU, as amended by Directive 2014/52/EU, for EIA in the nationally significant infrastructure regime.
- 2.2.9 The key aims and objectives of these Regulations are to ensure environmental considerations are integrated into decision-making for large infrastructure projects and to improve transparency, public participation and clarify over assessment criteria and the quality of information provided.
- 2.2.10 The Regulations set out the Environmental Impact Assessment (EIA) process, including procedures for EIA screening and scoping; notification and consultation; matters relating to the production of Preliminary Environmental Information Report (PEIR) and the preparation of Environmental Statements (ES).
- 2.2.11 This Scoping Report is being produced in accordance with Regulation 10 of the EIA Regulations 2017.

UK Planning Reform

Levelling up and Regeneration Act 2023

- 2.2.12 The Levelling-up and Regeneration Act 2023 (Ref 2-4) covers planning, regeneration, local democracy, infrastructure, environmental protections and more. Its aims to strengthen environmental protection and better mechanisms for community engagement, seeking to streamline planning and reduces delays.
- 2.2.13 The Act provides for replacing (via regulation) the current EU-derived systems of EIA with a new system called Environmental Outcomes Reports (EORs). This new system aims to create a simpler, clearer and more outcome focused environmental assessment. Instead of assessing and reporting likely impacts, it will measure and assess how developments perform against specified environmental outcomes that the government will define.
- 2.2.14 At the time of writing this Scoping Report, it is not yet determined what consents will be classed as Category 1 and 2 or how the specific environmental outcomes will be defined. Consequently, the applicant is still required to and intends to provide an ES in line with the EIA Regs (2017).

Planning and Infrastructure Act 2025

- 2.2.15 The Planning and Infrastructure Act (Ref 2-5) aims to overhaul and streamline the English planning and infrastructure consent system, including accelerating major infrastructure projects, and reform the NSIP regime. One of its purposes is to accelerate the rollout of clean energy and support decarbonisation goals. Key reforms include:
- a review of National Policy Statements (NSPs) every five years;
 - streamlining consultation requirements;
 - allow SoS to direct a project out of the NSIP regime; and
 - reduce opportunities for judicial review especially for cases “without merit”.

Marine and Coastal Access Act 2009

- 2.2.16 The Marine and Coastal Access Act 2009 provides the legal framework for activities in the UK marine area which comprises the inshore waters (territorial sea between Mean High Water Springs and 12 nautical miles limit) and offshore waters (12 nautical miles to 200 nautical miles).
- 2.2.17 A marine licence is required for licensable activities under the Marine and Coastal Access Act 2009. The Application for a DCO for the Proposed Development will include provisions for a deemed Marine Licence (DML) from the shoreline to MLWS. Consultation regarding the DML and any associated assessment required will be held with the MMO as the EIA/DCO application .

The Conservation of Habitats and Species Regulations 2017

- 2.2.18 The Conservation of Habitats and Species Regulations 2017 protect designated wildlife sites within the UK, including Special Protection Areas, and Special Areas of Conservation and European Sites. The regulations set out the requirements that developers and stakeholders of land which may affect designated habitats must follow, including the requirements to carry out impact assessments of the implications of a proposed development on designated sites, consultation with the relevant local authorities, and the criteria for securing compensation measures to protect designated sites. Further information on the Habitat Regulation Assessment is provided within Section 6.10, Chapter 6 of this document.

2.3 National Planning Policy

- 2.3.1 The following section provides a summary of the relevant national planning policy.

National Policy Statements

- 2.3.2 The PA2008 s104 requires the Secretary of State, when determining DCOs, to have regard to the provisions of National Policy Statements (NPS) (where relevant).
- 2.3.3 In terms of Proposed Development, the PA2008 s104 applies and applications will be tested against the relevant NPSs which include:
- Overarching National Policy Statement for Energy (EN-1) (Ref 2-6); and
 - National Policy Statement for Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4) (Ref 2-7).

National Policy Statements overview

- 2.3.4 The Overarching Energy NPS EN-1 requires the Secretary of State to take account of adverse environmental, social and economic impacts and weigh these against the benefits of the proposal. It identifies the generic issues which should be taken into account in assessing applications for development consent, recognising that these are the issues which are likely to arise most frequently, but that they are not equally applicable to all projects. In regard to carbon capture and storage, it recognises in Section 1.3.5 that:

“Where the need for a particular type of energy infrastructure set out above is established by this NPS, but that type of infrastructure is outside the scope of one of the technology specific NPSs, this NPS alone will have effect and will be the primary basis for Secretary of State decision making. This will be the case for, but is not limited to, unconventional hydrocarbon extraction sites, hydrogen pipeline and storage infrastructure, Carbon Capture Storage (CCS) pipeline infrastructure and other infrastructure not included in EN-2 or EN-3”.

2.3.5 Other notable sections of NPS EN-1 include:

- Section 3.5.1: *“There is an urgent need for new carbon capture and storage (CCS) infrastructure to support the transition to a net zero economy”*; and
- Section 3.5.2: *“The Climate Change Committee states that CCS is a necessity not an option”*.

2.3.6 NPS EN-1 also recognises CCS as Critical National Priority (CNP) infrastructure and states the following in that regard:

- Section 3.5.7: *“To support the urgent need for new CCS infrastructure, CCS technologies, pipelines and storage infrastructure are considered to be CNP infrastructure”*; and
- Section 4.2.23: *“Applicants for CNP infrastructure must continue to show how their application meets the requirements in this NPS and the relevant technology specific NPS, applying the mitigation hierarchy, as well as any other legal and regulatory requirements.”*

2.3.7 NPS EN-4 applies to nationally significant infrastructure pipelines which transport natural gas or oil and, therefore, is not relevant to the Proposed Development. However, NPS EN-4 notes in section 1.6.2 that the information provided within may also be useful in identifying impacts to be considered in applications for pipelines intended to transport other substances.

2.3.8 Section 2 of NPS EN-4 sets out principles to be applied in the assessment and mitigation design specific to oil and gas pipelines. The EIA and mitigation design will incorporate these principles. This includes:

- How proposals would be resilient to climate change;
- Consideration and demonstration of “good design”, in particular mitigation by design;
- Assessment of noise and vibration and typical noise mitigation measures;
- Assessment of water quality and resources including public water supply, and consultation with the Environment Agency (EA);
- Assessment of landscape and visual effects, and mitigation through design;
- Assessment of biodiversity, mitigation through design and project specific mitigation measures to protect ecology; and
- Assessment of the stability of the ground conditions and mitigation measures to minimise any adverse effects on soil and geology.

Industrial Decarbonisation Strategy 2021

2.3.9 The Industrial Decarbonisation Strategy (Ref 2-8) covers a range of UK industry sectors, including the cement and lime sectors, described as a key part of the combined mineral products industry, describing carbon capture as a key lever in achieving net zero. The targets presented in this strategy align with the Peak Cluster project.

UK carbon capture, usage and storage (CCUS)

2.3.10 This UK carbon capture, usage and storage (CCUS) collection (Ref 2-9) is a set of official government documents, policy papers and guidance published by DESNZ detailing how the government supports the development and deployment of carbon capture, usage and storage (CCUS) in the UK and internationally. This collection emphasises decarbonising sectors such as cement and lime.

The UK's Modern Industrial Strategy 2025

- 2.3.11 The UK's Modern Industrial Strategy 2025 (**Ref 2-10**) is a 10-year plan to increase business investment and grow the industries of the future in the UK. The Strategy will make it quicker and easier for business to invest and will provide the certainty and stability needed for long-term investment decisions. The Strategy highlights that supporting these hard-to-abate industries with CCUS helps preserve jobs whilst positioning the UK as a leader in low-carbon industrial infrastructure.
- 2.3.12 It includes a series of sector plans of which the Clean Energy Industries Sector Plan is of relevance, providing the strategic and financial underpinning that makes Peak Cluster possible and valuable in the UK's net-zero transition, identifying CCUS as one of its priority interventions.

2.4 UK Marine Policy Statement

- 2.4.1 Under section 104(2)(aa) of the Planning Act, in determining an application for development consent, the SoS must have regard to any marine policy documents (if any), determined in accordance with section 59 of the Marine and Coastal Access Act 2009 (Ref 2-11).
- 2.4.2 As part of the Proposed Development is located within the UK Marine Area, the application will be subject to UK Marine Policy Statement ("MPS"). The MPS acts as the planning framework for decision making affecting the marine environment and was prepared and adopted in compliance with the Marine and Coastal Access Act 2009. The MPS sets out high level policy context within which national, with sub-national Marine Plans developed for specific areas.
- 2.4.3 The relevant marine plan for the Proposed Development is the North West Inshore Marine Plan which is combined with the North West Offshore Marine Plan (herein referred to as the North West Marine Plan). The North West Marine Plan sets the strategic approach to planning within inshore and offshore waters between the River Dee in Wales, and the Solway Firth border in Scotland. The policies set out in the Marine Plan seek to enhance and protect the marine environment and achieve sustainable economic growth whilst respecting local communities both within and adjacent to the marine plan area.

2.5 National Planning Policy Framework

- 2.5.1 The National Planning Policy Framework (NPPF) (Ref 2-12) was last revised on 7 February 2025 and sets out the government's planning policies for England and how these are expected to be applied. It provides a framework within which locally prepared plans for housing and other development can be produced.
- 2.5.2 The NPPF states clearly the role of the NPS being the primary decision making document for NSIPs under the PA2008. Paragraph 5 of the NPPF states:

"The Framework does not contain specific policies for nationally significant infrastructure projects. These are determined in accordance with the decision-making framework in the Planning Act 2008 (as amended) and relevant national policy statements for major infrastructure, as well as any other matters that are relevant (which may include the National Planning Policy Framework). National policy statements form part of the overall framework of national planning policy and may be a material consideration in preparing plans and making decisions on planning applications."

- 2.5.3 In December 2025, the UK government published a draft version of a revised NPPF. This draft is for consultation only and sets out revised plan-making and decision-making policies. The draft reinforces national priorities around energy security, decarbonisation and economic growth.

2.6 Local Planning Policy – Local Development Plans

- 2.6.1 The Proposed Development/Scoping Boundary extends across the administrative areas of the following Local Planning Authorities (LPAs). It should be noted that these policies are not the basis for DCO decision making but will inform the local impact reports prepared by the LPAs to which the Secretary of State must have regard under s104(2)(b) of PA2008 and are expected to be important and relevant considerations under s104(2)(d) of PA2008:

- **Peak District National Park Authority (NPA)** is a public body made up of members and officers. The law requires the Peak District National Park Authority to carry out two statutory purposes, namely, to conserve and enhance the natural beauty, wildlife and cultural heritage of the area, and to promote opportunities for the understanding and enjoyment of the parks special qualities by the public;
- **High Peak Borough Council** is a district-level council following a two-tier council structure meaning that some services are delivered by this borough Council and other are provided by Derbyshire County Council;
- **Staffordshire Moorlands District Council** is a district level council following a two-tier council structure meaning that some services are delivered by this borough Council and others are provided by Staffordshire County Council;
- **Staffordshire County Council** is a county level council responsible for roads, minerals, and waste, and the management of Public Rights of Way (amongst other things);
- **Derbyshire Dales District Council** is a district-level council following the same two-tier structure as High Peak Borough Council;
- **Derbyshire County Council** is a county level council responsible for roads, minerals, and waste, and the management of Public Rights of Way (amongst other things);
- **Cheshire East Council** is a unitary authority with the combined responsibilities of a district and county council covering the areas of Congleton, Crewe, Nantwich and Macclesfield;
- **Cheshire West and Chester Council** is a unitary authority with the combined responsibilities of a district and county council covering the areas of Chester, Ellesmere Port, Northwich and Winsford; and
- **Wirral Council** is a metropolitan district council responsible for the governance of the Merseyside portion of the Wirral.

- 2.6.2 The relevant local planning documents are as follows:

- Peak District National Park Local Development Framework (Adopted October 2011) (Ref 2-13);
- High Peak Local Plan (Adopted April 2016) (Ref 2-14);
- Staffordshire Moorlands Local Plan 2014 – 2033 (Adopted 9 September 2020) (Ref 2-15);
- The Minerals Local Plan for Staffordshire 2015 – 2030 (Adopted 16 February 2017) (Ref 2-16);
- Cheshire East Local Plan 2010 – 2030 (Adopted 27 July 2017) (Ref 2-17);

- Cheshire West and Chester Local Plan (Adopted 29 January 2015) (Ref 2-18); and
- Wirral Local Plan 2022 – 2040 (Adopted 31 March 2025) (Ref 2-19).

2.6.3 Several Local Authorities are currently progressing the development of new Local Plans which are detailed in Table 2-1.

Table 2-1: Status of Emerging Plans

Local Authority	Status of New Local Plan
Peak District National Park	Regulation 18 Issues and Options Consultation commenced in autumn 2025. Anticipated Regulation 19 Consultation to be carried out in spring 2026. Anticipated submission of December 2026.
Derbyshire County Council New Waste Local Plan	Anticipated submission of January/February 2027. Anticipated adoption of December 2027.
Derbyshire County Council New Minerals Local Plan	The new Minerals Local Plan is currently in examination. Anticipated July 2026.
High Peak Borough Council	Anticipated submission of Spring 2026.
Cheshire West and Chester	Regulation 18 Consultation closed on 29 August 2025. Anticipated Regulation 19 Consultation to be carried out in Autumn 2026. Anticipated submission of December 2026. Anticipated adoption of summer/autumn 2027.

2.7 References

Ref 2-1 HM Government (2008). The Planning Act 2008. Available at:

<https://www.legislation.gov.uk/ukpga/2008/29/contents>

Ref 2-2 HM Government (2017). Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended). Available at:

<https://www.legislation.gov.uk/uksi/2017/572/contents>

Ref 2-3 HM Government (2010). The Infrastructure Planning (Decisions) Regulations 2010.

Available at: <https://www.legislation.gov.uk/uksi/2010/305/contents/made>

Ref 2-4 HM Government (2023). Levelling-up and Regeneration Act 2023. Available at:

<https://www.legislation.gov.uk/ukpga/2023/55/contents>

Ref 2-5 HM Government (2025). Planning and Infrastructure Act. Available at:

<https://www.legislation.gov.uk/ukpga/2025/34/contents/enacted>

Ref 2-6 Department for Energy Security and Net Zero (2025) Overarching National Policy Statement for Energy (EN-1). Available at:

<https://assets.publishing.service.gov.uk/media/68093d68148a9969d2394f59/draft-nps-en-1.pdf>

- Ref 2-7** Department for Energy Security and Net Zero (2024) National Policy Statement for Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4). Available at: <https://assets.publishing.service.gov.uk/media/65a789a8867cd8000d5ae9be/nps-natural-gas-supply-infrastructure-pipelines-en4.pdf>
- Ref 2-8** Department for Energy Security and Net Zero and Department for Business, Energy & Industrial Strategy (2021). Industrial Decarbonisation Strategy. Available at: <https://www.gov.uk/government/publications/industrial-decarbonisation-strategy>
- Ref 2-9** Department for Energy Security and Net Zero (2025) UK carbon capture, usage and storage (CCUS). Available at: <https://www.gov.uk/government/collections/uk-carbon-capture-usage-and-storage-ccus>
- Ref 2-10** Department for Business and Trade (2025) UK's Modern Industrial Strategy 2025. Available at: <https://www.gov.uk/government/collections/the-uks-modern-industrial-strategy-2025>
- Ref 2-11** HM Government (2009) Marine and Coastal Access Act 2009. Available at: <https://www.legislation.gov.uk/ukpga/2009/23/contents>
- Ref 2-12** Ministry of Housing, Communities & Local Government (2024) National Planning Policy Framework. Available at: https://assets.publishing.service.gov.uk/media/67aafe8f3b41f783cca46251/NPPF_December_2024.pdf
- Ref 2-13** Peak District National Park (2011) Peak District National Park Local Development Framework. Available at: <https://www.peakdistrict.gov.uk/planning/policies-and-guides/core-strategy>
- Ref 2-14** High Peak Borough Council (2016) High Peak Local Plan 2016. Available at: <https://www.highpeak.gov.uk/article/646/The-Adopted-Local-Plan-2016>
- Ref 2-15** Staffordshire Moorlands District Council (2014). Staffordshire Moorlands Local Plan 2014. Available at: <https://www.staffsmoorlands.gov.uk/localplan>
- Ref 2-16** Staffordshire County Council (2015) The Minerals Local Plan for Staffordshire. Available at: <https://www.staffordshire.gov.uk/environment/planning/policy/mineralslocalplan/mineralslocalplan.aspx>
- Ref 2-17** Cheshire East Council (2010) Cheshire East Local Plan 2010 – 2030. Available at: <https://www.cheshireeast.gov.uk/planning/spatial-planning/cheshire-east-local-plan/local-plan-strategy/local-plan-strategy.aspx>
- Ref 2-18** Cheshire West and Chester Council (2015) Cheshire West and Chester Local Plan. Available at: <https://www.cheshirewestandchester.gov.uk/your-council/policies-and-performance/council-plans-policies-and-strategies/planning-policy/local-plan>
- Ref 2-19** Wirral Council (2022) Wirral Local Plan 2022 – 2040. Available at: <https://www.wirral.gov.uk/planning-and-building/local-plans-and-planning-policy/wirral-development-plan/wirral-local-plan>

3. The Proposed Development

3.1 Overview

- 3.1.1 The Proposed Development will comprise a new - build underground carbon dioxide pipeline, associated capture facilities at cement and lime facilities in Derbyshire and Staffordshire and a connection to the MNZ carbon dioxide store in the east Irish Sea. Peak Cluster is expected to capture and store over 3 million tonnes of CO₂ every year and will be designed to allow other industrial sites to connect to a carbon store in the future.
- 3.1.2 The key components of the Proposed Development will be:
- Breedon Capture Facility;
 - Tarmac Capture Facility;
 - Buxton Lime Capture Facility;
 - Holcim Capture Facility;
 - Peak Cluster Pipeline; Above Ground Installations (AGIs);
 - Block Valve Stations (BVS);
 - Coastal AGI;
 - Coastal AGI to Mean Low Water Springs (MLWS) Pipeline(s);
 - Works required for construction and operation including, but not limited to, construction compounds, temporary construction access, permanent access and environmental mitigation; and
 - Other ancillary works, such as utilities diversions and cathode protection.
- 3.1.3 Figure 3-1 provides an overview of the location of the key components of the proposed Development.

3.2 Description of the Proposed Development

Cement and Lime Works – Capture Facilities

- 3.2.1 The design of each capture facility is being progressed by the Peak Cluster partner that operates that site. The requirements for the capture facility, operating conditions, space availability and the availability of utilities at each site are different. It should be expected, therefore, that different capture technology selection and other design choices will be made for each capture facility to optimise for each site's specific needs and circumstances.
- 3.2.2 As each partner progresses through the design process, the range of viable technology and design choices available may also be different. The level of flexibility that is being retained to ensure an optimal final design can be selected will be provided, along with justification for that flexibility, within the DCO application.
- 3.2.3 Currently all of the Capture Facility Operators have planning permission for their existing operations until 2042. This date was imposed by the Town & Country Planning (Minerals) Act 1981, which introduced a provision to impose an end-date on all historic planning permissions for

mineral working across Great Britain that were granted permission before 22nd February 1982 without a specified end-date. This was set at February 2042, 60 years after the power came into effect. This date currently affects the vast majority of minerals planning permissions, including those of the Capture Facility Operators that form part of Peak Cluster.

- 3.2.4 Should the Capture Facility Operators seek to extend the working life of their existing operations, they would need to apply for a variation to their existing planning permission(s). This would need to be supported by the required technical and environmental information that would be assessed on its own merits by the relevant determining authority.

Breedon Capture Facility

- 3.2.5 Hope Cement Works is operated by Breedon Cement Limited and is located near Castleton, in the Hope Valley, Derbyshire (Grid reference SK 16498245). Hope Cement Works is situated within the Peak District National Park with its location shown on Figure 3-2.
- 3.2.6 The principal activity at the works is the production of cement, and the installation operates under an Environmental Permit for producing cement clinker in rotary kilns with a production capacity exceeding 500 tonnes per day. The capacity of the works is approximately 1.45 million tonnes per annum and cement clinker is produced continuously, 24 hours a day, seven days a week using two kilns.



Plate 3-1: Existing Breedon Hope Cement Works

Overview

- 3.2.7 Breedon is considering a range of licensed CO₂ capture technologies including those based on proprietary amine solvents and cryogenic separation.
- 3.2.8 The overall layout of the Breedon Capture Facility is subject to further engineering design, but the key elements will comprise:

- Breedon Capture Facility. At this stage, the final technology selection for the capture facility has not been made. The Applicant is considering a range of CO₂ capture technologies including those based on proprietary amine solvents; non-amine solvent; hot potassium carbonate solvent; pressure swing absorption; and cryogenic separation. There will be one process stream, covering both lines of the existing cement works;
- Parking, access and maintenance routes for the Breedon Capture Facility;
- Provision of new chemical storage areas, vessels, tanks to hold the required inputs and outputs of the operational processes;
- New and reconfigured existing infrastructure; for example, there will be physical works within the existing facility to modify the infrastructure, create the connections to enable the exhaust gases to be diverted for the recovery of CO₂;
- New utility infrastructure or reinforcements to existing networks;
- A new AGI to connect the CO₂ from the Breedon Capture Facility to the Peak Cluster Pipeline;
- Landscaping and drainage areas, including biodiversity enhancements; and
- Normal operational lighting, emergency lightning and escape lighting will be installed.

3.2.9 The Breedon Capture Facility will either be controlled from a new control room or be managed and controlled from the existing facility (and therefore, new communication systems would also be installed on site).

3.2.10 Whilst the current power supply is sufficient for the existing plant, it does not have sufficient capacity to allow deployment of carbon capture technology at the site. It is anticipated that the additional power demand will be supplied by either direct grid connection or onsite gas-fired power generation. These options are currently being considered.

3.2.11 If power is supplied from the grid, a new substation will be included within the scope of the Proposed Development. Any additional connection between the substation and the grid is assumed to be the responsibility of the Distribution Network Operator (DNO). This will be outside the scope of the Proposed Development but potential cumulative effects will be considered in the EIA.

3.2.12 If an on-site power solution is implemented, a generating station (expected to be gas engine(s) or gas turbine(s)) and a new natural gas AGI may be required. The consenting strategy for this is still to be determined. The environmental effects will be addressed appropriately within the ES. Any additional connection between the AGI and the gas network is assumed to be the responsibility of the Gas Distribution Network (GDN) operator. This will be outside the scope of the Proposed Development but potential cumulative effects will be considered in the EIA.

3.2.13 It is expected that CO₂ emissions from any on site power generation would be captured and transported for storage via the Peak Cluster Pipeline.

3.2.14 A new standby generator will be required to supply emergency shutdown loads upon loss of main supplies.

3.2.15 It is assumed that raw water will be supplied to a demineralising water plant either from the existing lagoons on-site or by abstraction from the underlying groundwater via a new borehole. Appropriate permits and licenses will be obtained, where required.

- 3.2.16 Excess wastewater will be treated to a standard suitable for surface water discharge via existing lagoons. Water runoff will connect into the site-wide system which will be upgraded as part of the Proposed Development.

Construction

- 3.2.17 Construction of the Breedon Capture Facility is expected to begin in 2029 and is anticipated to take approximately 4 years, including:

- Enabling works;
- Civil works;
- New infrastructure installation;
- Mechanical installation;
- Electrical installation;
- Control and instrument installation; and
- Commissioning.

- 3.2.18 The exact routing of vehicles during construction is under determination. Data identifying heavy goods vehicle (HGV) two-way movements per day will be developed. The use of the existing rail line into the existing facility will also be explored for the import of construction materials, where practicable. The potential need for works to the existing rail facilities on-site is being explored.

Operation

- 3.2.19 The Breedon Capture Facility will be operational 24 hours a day, seven days a week in conjunction with the existing facility, with short-term routine shutdown maintenance periods when required.
- 3.2.20 The number of operational jobs generated to operate the Breedon Capture Facility will be dependent on the technological solution chosen but it is estimated to generate between 20-56 Full Time Equivalent (FTE) jobs.

Decommissioning

- 3.2.21 The anticipated design life of the Breedon Capture Facility will be for at least 25 years. However, at the end of this period the residual life would be considered and an investment decision taken on whether to extend its operating life.
- 3.2.22 At the end of the operating life, the Breedon Capture Facility would be decommissioned, with all above ground structures removed in accordance with the appropriate legislation, standards and guidance at the time of decommissioning. A Decommissioning EMP would be developed to help ensure all required environmental measures are implemented.

Tarmac Capture Facility

- 3.2.23 Tunstead Cement Works is operated by Tarmac Cement Limited and is located near Buxton in Derbyshire (Grid Reference SK 09773 74111).
- 3.2.24 Quarrying has occurred there since 1929, supplying materials for cement production and other uses, and the plant itself produces cement through a process of clinker formation and milling, utilising various fuels.



Plate 3-2: Existing Tarmac Tunstead Cement Works

Overview

- 3.2.25 An extensive feasibility study was commissioned by Tarmac/CRH in 2023 which reviewed the suitability of various carbon capture techniques at the Tunstead Cement Works. The capture technologies were assessed in a stepwise approach to identify an optimal technological choice from the variety of capture methods.
- 3.2.26 A study has been undertaken which has concluded that cryogenic capture within an oxyfuel environment is the optimal solution for the site. Capture efficiency is expected to be no less than 95% in normal operating conditions.
- 3.2.27 The overall layout of the Tarmac Capture Facility is subject to further engineering design, but the key elements will comprise:
- The Tarmac Capture Facility: Cryogenic capture within an oxyfuel environment. Oxyfuel technology increases CO₂ concentration in cement plant exhaust gases to 70%-85% by using a mix of recycled gases and pure oxygen. It minimises energy consumption for CO₂ capture and can be retrofitted to existing facilities. Oxyfuel technology does not create additional CO₂ emissions and is highly integrated. In terms of visual impact, the Air Separation Unit (ASU) column with a likely height below 70 m is the highest point of the capture facility. The ASU will be situated close to the cement plant to reduce ducting. The tallest structures on site remain as the existing cement flue gas stack;
 - Parking, access and maintenance routes for the Tarmac Capture Facility will remain within the current site boundary;
 - New and reconfigured existing infrastructure as part of Tarmac Tunstead development plans;

- New utility infrastructure or reinforcements to existing networks;
- A new AGI to connect the gas from the capture unit to the Peak Cluster Pipeline;
- Landscaping and drainage areas, including biodiversity enhancements; and
- Normal operational lighting, emergency lightning and escape lighting will be installed.

- 3.2.28 Whilst the current power supply is sufficient for the existing facility, it does not have sufficient capacity to allow deployment of carbon capture technology at the site. It is anticipated that additional power demand will be supplied from the DNO Electricity Northwest (ENW), which will require an additional sub-station on Tarmac owned land or on-site power generation. These options are currently being considered.
- 3.2.29 If power is supplied from the grid, a new substation will be included within the scope of the Proposed Development. Any additional connection between the substation and the grid is assumed to be the responsibility of the Distribution Network Operator (DNO). This will be outside the scope of the Proposed Development, but potential cumulative effects will be considered in the EIA.
- 3.2.30 If an on-site power solution is implemented, a generating station (technology is still to be determined) and a new natural gas AGI may be required. The consenting strategy for this is still to be determined. The environmental effects will be addressed appropriately within the ES. Any additional connection between the AGI and the gas network is assumed to the responsibility of the Gas Distribution Network (GDN) operator. This will be outside the scope of the Proposed Development, but potential cumulative effects will be considered in the EIA. It is expected that CO₂ emissions from any on site power generation would be captured and transported for storage via the Peak Cluster Pipeline.
- 3.2.31 The carbon capture technology produces condensate which will be processed in a new water treatment plant. In contrast to most chemical post-combustion technologies, oxyfuel technology consumes less water.
- 3.2.32 For cooling purposes, closed circuit systems are assumed, which limit the external water demand to a make-up stream. Some demineralised water is required for the operation of the Carbon Processing Unit (CPU) which is currently assumed to be covered by treated condensate. This implies that no additional ground water may be needed subject to further engineering studies.

Construction

- 3.2.33 Construction of the Tarmac Capture Facility is expected to begin in 2029 and is anticipated to take approximately 28 months, including:
- Site clearance / demolition;
 - Earthworks;
 - Civil works;
 - Capture Equipment installation;
 - Cement kiln modifications;
 - Electrical equipment installation; and
 - Commissioning.

- 3.2.34 Access for HGVs and light vehicles during the construction period will principally be through the existing main access route to the quarry and cement plant.

Operation

- 3.2.35 The Tarmac Capture Facility will be operational 24 hours a day, seven days a week in conjunction with the existing facility, with short-term routine shutdown maintenance periods when required.
- 3.2.36 The number of operational jobs generated to operate the Tarmac Capture Facility will be determined following further study.

Decommissioning

- 3.2.37 The design life of the Tarmac Capture Facility will be a minimum 25 years. However, at the end of this period the residual life would be considered and an investment decision taken on whether to extend its operating life.
- 3.2.38 At the end of the operating life, the Tarmac Capture Facility would be decommissioned, with all above ground structures removed and ground remediated in line with the site's environmental permit. A Decommissioning EMP would be developed to help ensure all required environmental measures are implemented.

Buxton Lime Capture Facility

- 3.2.39 Buxton Lime operates from and within the Tarmac Tunstead Site (described above) under lease.

Overview

- 3.2.40 The CCS technology selected for the Buxton Lime Capture Facility was evaluated against several criteria, including CO₂ capture efficiency, energy consumption, chemical requirements, site layout, design maturity, and availability within the lime production sector. The existing onsite process was also reviewed to assess compatibility and ease of integration. Following a comprehensive analysis of available carbon capture technologies, a two step solution was chosen: (1) convert lime kilns by using oxyfuel technology in order to increase CO₂ concentration in the flue gas (2) utilise pressure swing adsorption (PSA) and cryogenic CO₂ capture to further refine the CO₂ to 95% concentration.
- 3.2.41 The Buxton Lime site currently operates a single conventional parallel flow regenerative (PFR) kiln and up to five normal shaft kilns (NSKs). The NSKs are not suitable to be retrofitted with carbon capture equipment. It is possible to retrofit carbon capture equipment to the existing PFR kiln. To mitigate both economic and technical uncertainties, the proposal is to retrofit the existing kiln and install two replacement carbon capture ready PFR kilns.
- 3.2.42 The technology selection for the Buxton Lime Capture Facility is likely to involve the installation of oxyfuel PFR kilns, retrofitting existing PFR kiln with oxyfuel and pressure swing absorption (PSA) technology, with further engineering and design work currently being undertaken to confirm this.
- 3.2.43 Capture efficiency is expected to be no less than 95% in normal operating conditions.
- 3.2.44 The existing lime kilns are fired with natural gas. In the proposal the retrofitted PFR kiln and two replacement kilns will utilise either natural gas or biomass. The consenting route for the biomass facilities is to be determined.
- 3.2.45 Whilst the current power supply is sufficient for the existing facility, it does not have sufficient capacity to allow deployment of carbon capture technology at the site. It is anticipated that additional power demand will be supplied from the DNO Electricity Northwest (ENW), which will

require an additional sub-station on Tarmac owned land or on-site power generation. These options are currently being considered in conjunction with Tarmac.

- 3.2.46 The carbon capture technology produces condensate which will be processed in a new water treatment plant. In contrast to most chemical post-combustion technologies, oxyfuel technology consumes less water.
- 3.2.47 For cooling purposes, closed circuit systems are assumed, which limit the external water demand to a make-up stream. Some demineralised water is required for the operation of the Carbon Processing Unit (CPU) which is currently assumed to be covered by treated condensate. This implies that no additional ground water may be needed subject to further engineering studies.
- 3.2.48 The overall layout of the Buxton Lime Capture Facility is subject to further engineering design, but the key elements will comprise:
- The Buxton Lime Capture Facility. Carbon capture technology will be fitted to the existing PFR lime kiln. There will also be additional installation of two replacement kilns and pressure swing absorption technology. In terms of visual impact, the ASU column with a height below 70m is the highest point of the capture facility. The ASU will be situated close to the lime plant to reduce ducting. The existing cement flue stack (associated with the Tarmac Tunstead cement plant) will likely remain the tallest structure on the Tunstead site;
 - Parking, access and maintenance routes will remain within the existing Tunstead site boundary. Access during construction and operation will be through the main access route to the existing quarry and lime plant;
 - New / reconfigured existing infrastructure such as modifications to the stone distribution system to feed the replacement kilns;
 - New utility infrastructure or reinforcements to existing networks;
 - Connection with Tunstead AGI to connect the gas from the capture unit to the Peak Cluster Pipeline; and
 - Normal operational lighting, emergency lighting and escape lighting.

Construction

- 3.2.49 Construction of the capture facility, subject to a final investment decision is expected to begin at the latest in 2029 and is anticipated to take approximately 28 months including:
- Site clearance / demolition;
 - Earthworks;
 - Civil works;
 - Capture equipment installation;
 - Lime kiln installation and modifications;
 - Electrical equipment installation; and
 - Commissioning.

Operation

- 3.2.50 The Buxton Lime Capture Facility will be operational 24 hours a day, seven days a week in conjunction with the existing facility, with short-term routine shutdown maintenance periods when required.
- 3.2.51 The number of operational jobs generated to operate the Buxton Lime Capture Facility will be determined following further study.

Decommissioning

- 3.2.52 The design life of the capture facility will be a minimum 25 years. However, at the end of this period the residual life would be considered and an investment decision taken on whether to extend its operating life.
- 3.2.53 At the end of the operating life, the facility would be decommissioned, with all above ground structures removed in line with the Buxton Lime lease agreement and Tarmac Cement Environmental Permit. A Decommissioning EMP would be developed to help ensure all required environmental measures are implemented.

Holcim Capture Facility

- 3.2.54 Caudon Cement Works is operated by Holcim UK and is located near Waterhouses in Staffordshire (Grid reference SK 07437 48952), approximately 8 miles from the town of Leek.

Overview

- 3.2.55 The Holcim Capture Facility will involve the installation of carbon capture equipment at the existing Caudon Cement Plant. At this stage, the final technology selection for the capture facility has not been made. However, capture efficiency is expected to be no less than 95%.
- 3.2.56 At this stage, the final technology selection for the capture facility has not been made. The Applicant is considering a range of CO₂ capture technologies and the overall layout of the capture facility is subject to further engineering design, but the key elements will comprise:
- The Holcim Capture Facility;
 - Parking, access and maintenance routes for the Holcim Capture Facility;
 - Provision of new chemical storage areas, vessels, tanks to hold the required inputs / outputs of the operational processes;
 - New and reconfigured existing infrastructure;
 - New utility infrastructure or reinforcements to existing networks;
 - A new AGI to connect the gas from the Holcim Capture Facility to the Peak Cluster Pipeline;
 - Consideration of additional water and effluent treatment;
 - Landscaping and drainage areas including biodiversity enhancements; and
 - Normal operational lighting, emergency lighting and escape lighting will be installed.



Plate 3-3: Existing Holcim Caudon Cement Works

- 3.2.57 Power is expected to be provided via a new connection to the local network at Forsbrook, which will require additional sub-stations on Holcim owned land.
- 3.2.58 The new substations will be included within the scope of the Proposed Development. Any additional connection between the substation and the grid is assumed to be the responsibility of National Grid / the DNO. This will be outside the scope of the Proposed Development but potential cumulative effects will be considered in the EIA.
- 3.2.59 Water runoff is expected to connect into the site-wide system which will be upgraded as part of the Proposed Development.

Construction

- 3.2.60 Construction of the capture facility is expected to begin in 2029 and is anticipated to take approximately 48 months, including:
- Site clearance / demolition;
 - Earthworks;
 - Civil works;
 - Capture equipment installation;
 - Cement kiln modifications;
 - Electrical equipment installation; and
 - Commissioning.
- 3.2.61 Laydown areas are anticipated to be on land south of the Earlsway, with existing hard standing around the quarry offices used where possible and other space being made available as required.
- 3.2.62 Access for HGVs and light vehicles during the construction period will be via the Earlsway Road.

Operation

- 3.2.63 It is assumed that the Holcim Capture Facility will be operational 24 hours a day, seven days a week in conjunction with the existing facility, with short-term routine shutdown maintenance periods when required. Access will be via existing plant and office-controlled entry points.
- 3.2.64 At the present time, it is anticipated that an additional 28 staff will be required to operate the Holcim Capture Facility.

Decommissioning

- 3.2.65 The design life of Holcim Capture Facility will be 25 years. However, at the end of this period the residual life would be considered and an investment decision taken on whether to extend its operating life.
- 3.2.66 At the end of the operating life, Holcim Capture Facility would be decommissioned, with all above ground structures removed and ground remediated in line with the site's Environmental Permit. A Decommissioning EMP would be developed to help ensure all required environmental measures are implemented.

Peak Cluster Pipeline

Overview

- 3.2.67 The Peak Cluster Pipeline involves the construction, operation, and maintenance of approximately 195 km of new onshore pipeline designed to transport carbon dioxide collected at the capture facilities to the Coastal AGI (in a gas phase), for onward transportation offshore. Along the proposed pipeline route, a series of Above Ground Installations (AGIs) and Block Valve Stations (BVS) will be constructed at key locations. These facilities are essential for the operation and maintenance of the pipeline network. Engineering work is currently being undertaken to identify the most appropriate locations for these facilities. The pipeline design life is expected to significantly exceed that of the capture facilities (25 years) with appropriate monitoring and maintenance.

Pipeline Consenting

- 3.2.68 A preliminary pipeline scoping corridor has been identified, including alternative routes at some key locations, which is approximately 300 m wide. This corridor has been selected after a series of design reviews which included engineering and environmental considerations. Further information is included within Section 3.4 Design Evolution and Consideration of Alternatives.
- 3.2.69 The Scoping Boundary (Figure 1-2) does not include mitigation land, off-route access roads, temporary compounds and connections to local utilities that may be required as the locations of these are not yet known. These will be included in the draft Order Limits for the Proposed Development, included in the EIA and consulted on during the pre-application stage.
- 3.2.70 Through further detailed engineering and environmental work, along with feedback received in response to Non-Statutory Consultation, the scoping corridor will be further refined down to an approximately 100 m wide boundary within which consent will be sought to construct the pipeline under the DCO. Consenting within a corridor of 100 m allows the construction contractor flexibility to make minor routing adjustments at detailed design stage, which may include but will not be limited to:
- Optimising alignment at crossings;

- Minimising disruption to ecological features such as trees and nesting sites;
- Mitigating archaeological or environmental impacts;
- Accommodating other land uses and landowner requests; and
- Addressing constructability or safety concerns.

3.2.71 As part of the consenting and approvals process, further surveys will be conducted as required.

Peak Cluster Pipeline Construction

3.2.72 Once the pipeline routing is selected, construction methodology and mitigation measures will be considered and planning undertaken to inform phasing and programme. Construction will be carried out in line with specific UK regulatory requirements and industry best practices, ensuring full compliance with statutory obligations.

Open Trench Installation

3.2.73 The pipeline will be built primarily using open-cut trench installation. During construction, the contractor will establish the pipeline working width, typically ranging from 30 to 40 m in width. This will be the physical working area within which the pipeline will be laid.

3.2.74 Establishing a working width will involve clearing vegetation, appropriately fencing or demarcating working areas, stripping and storing topsoil and constructing any accesses or off-route haul roads as required.

3.2.75 The contractors will then lay pipe sections on the ground surface (stringing out), before welding, inspecting and coating joints. The pipeline trench will then be excavated, before lowering the pipe into the trench, and backfilling it with the excavated soil. Works are coordinated to ensure the pipeline trench is open for as little time as possible (days) for any individual section.

3.2.76 In areas of shallow rock, blasting may be required to enable effective trench excavation.

3.2.77 Pre-commissioning of the pipeline, including hydrostatic testing will be undertaken before final reinstatement of any disrupted services and topsoil.

3.2.78 Plate 3-4 below shows an example of a 36 m wide working width, including allowance for the trench and topsoil storage, pipeline stringing out, and movement of construction vehicles along the pipeline route. Exact dimensions of the working width are dependent on multiple local factors such as soil conditions, size of pipeline, topography and special crossing requirements.

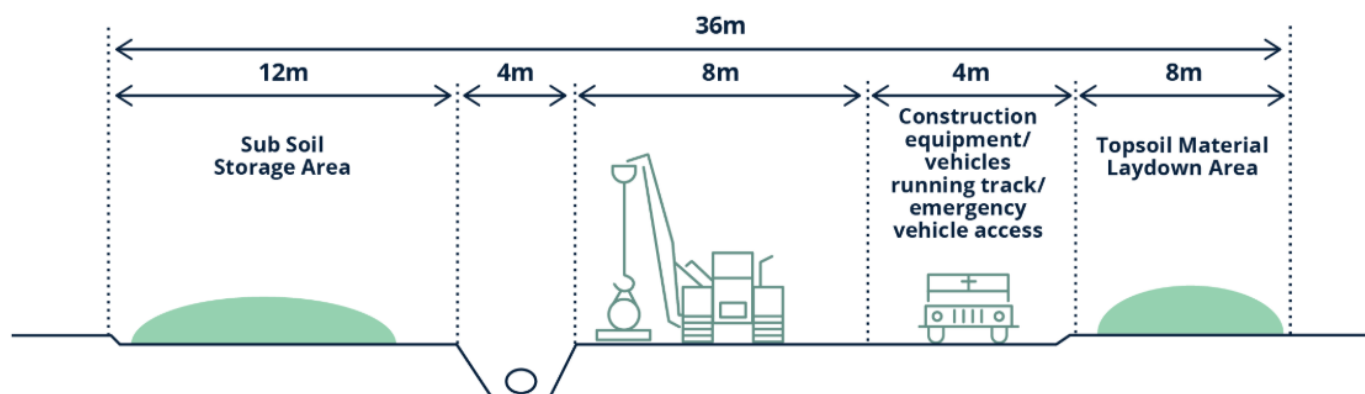


Plate 3-4: Diagram of Open Trench Excavation

- 3.2.79 A larger working area is likely to be required at special crossings such as highways, watercourses, railways and service crossings, in areas of side slopes, at some hedge crossings and at some intersection points where the pipeline route changes direction. This is to facilitate safe working and provide additional spoil storage and equipment laydown.
- 3.2.80 Subject to obtaining the necessary permits and consents, drainage ditches and small streams will be flumed by the installation of temporary pipes and ramped over to create a continuous running track for construction vehicles and allow continuous flow of water within the ditch. Temporary arrangements will be made for any land drainage encountered and any interventions will maintain the local drainage systems.

Trenchless Pipeline Installation

- 3.2.81 Trenchless construction techniques will be required at points along the pipeline where open-trench installation is either not possible or is undesirable due to existing obstacles. This typically includes crossings of motorways and major highways, railway infrastructure, ecologically sensitive areas (e.g. SSSI, ancient woodland) and major water courses (e.g. main rivers, canals). The most common trenchless installation techniques are:
- *Horizontal Directional Drilling*: typically used in areas with stable ground conditions and long-distance but small-bore crossings. A larger stringing out area is required as the pipe is fabricated to the whole length of the crossing before it is installed. This means the working areas for pipeline stringing are usually as large as the crossing length. It is typically used where crossings are not sensitive to ground settlement.
 - *Auger Boring*: typically used where short crossings are required at shallow depths in favourable ground conditions.
 - *Micro-tunnelling*: typically used where surface infrastructure is sensitive to settlement and areas where poor ground conditions are not suited to other methods.
- 3.2.82 The chosen trenchless installation techniques will ultimately be determined by several factors including the feature to be crossed, agreement with third parties regarding asset protection, ground conditions and the length and depth of the crossing required. This will not be defined until after the DCO has been granted, the construction contract has been awarded and detailed design complete; therefore, the potential impact of all installation techniques will be considered, and a reasonable worst case assessed. Trenchless crossings often require 24hr operation as part of the installation method.

General Construction

- 3.2.83 Prior to construction, Construction Environmental Management Plans (CEMP) and Traffic Management Plan(s) (TMP) will be written to show how issues including air quality, noise, visual impacts and traffic management that may arise because of the project will be managed.
- 3.2.84 Lighting for the safety of personnel working during the hours of darkness (typically winter months) in the form of task lighting (erected temporarily for a specific task) or lighting for the use of compounds will be required.
- 3.2.85 Construction is anticipated to take around 3 years to complete across the whole route although each section will be constructed over a shorter timeframe than that. This will be further defined as FEED and consenting progresses.
- 3.2.86 Construction disruption would not occur across the entire length of the pipeline for the whole construction period as the pipeline will be built in sections.

- 3.2.87 Construction compounds will be required along the pipeline working width to allow for storage of materials, access to the pipeline working widths, to construct AGIs, BVSs and possible Compressor Stations (if deemed required). Construction compounds are likely to include the following:
- Secure fencing and lighting;
 - Hardcore or sealed surfaces and drainage;
 - Site offices;
 - Vehicle/plant storage and associated fuel storage; and
 - Storage for pipes, equipment and materials.
- 3.2.88 The size, scale and location of construction compounds depend on multiple factors and will be defined as the design of the project evolves.
- 3.2.89 Once the pipeline has been constructed, the temporary construction compounds would be removed and the land reinstated to its original condition. Any landscaping that is required would be prepared and delivered in accordance with the DCO.

Pipeline Maintenance

- 3.2.90 In accordance with the Pipeline Safety Regulations 1996, The design of the pipeline should take due account of the need to facilitate examination and maintenance. Following construction, the pipeline will be safeguarded through the establishment of leases and/or easements. These measures will restrict third party construction and groundworks in the vicinity of the pipeline and ensure access for repairs and maintenance if required.
- 3.2.91 Once operational, the development will be subject to an inspection and maintenance programme in line with regulatory requirements and industry best practice. This programme will typically include:
- Regular vantage point surveys of the pipeline easement (typically every week);
 - Aerial inspections conducted by helicopter (typically every two weeks);
 - Annual walk-over surveys along the entire pipeline network;
 - Routine testing of the cathodic protection system, including:
 - Inspection of transformer rectifier cabinets and current measurements at CP test points (typically monthly);
 - Checks of electrical equipment, safety systems, protective devices, and operational status (typically every six months); and
 - Coating defect surveys (typically every four years).
 - Internal pipeline cleaning and inspection using PIGs (typically every five-years).
- 3.2.92 Any defects or issues identified during inspections will be addressed through appropriate remedial actions.

Decommissioning

- 3.2.93 At the end of the operating life, the pipeline would be decommissioned safely and left in-situ in line with current UK industry practice (e.g. UK Onshore Pipeline Operators Association, Good

Practice Guide: Pipeline Decommissioning and Abandonment (UKOPA/GP/038) (Ref 3-1). All above ground structures will be removed and land restored to its previous use.

Above Ground Installations

- 3.2.94 Above Ground Installations (AGIs) serve as critical transition points along the pipeline, designed to ensure the safe and efficient operation of the system. These installations facilitate routine inspection and maintenance activities, supporting both operational reliability and regulatory compliance.
- 3.2.95 Search areas for AGIs have been identified within the pipeline route corridors, the locations of these search areas have been informed by the points on the pipeline network where connections are required, with the search areas also being sited to avoid key designations or constraints where possible. Currently, AGI search area locations have been identified for the:
- *North Feeder Pipeline AGI* – which is the connection point for the pipelines running from the Breedon Capture Facility and that of the Tarmac/Buxton Lime Capture Facilities;
 - *Central Feeder AGI* – which is the connection point for pipelines from the Holcim Capture Facility and the North Feeder AGI;
 - *Connection AGI 1* – which is the connection AGI for potential future carbon capture plants, proposed to be located to the north of Holmes Chapel;
 - *Connection AGI 2* – which is the connection AGI for potential future carbon capture plants, proposed to be located to the south of Ellesmere Port;
 - *Connection AGI 3* – which is the connection AGI for potential future carbon capture plants, proposed to be located to the west of Ellesmere port on the Wirral Peninsular;
 - *Coastal AGI* – which will be connected to the Peak Cluster pipeline, where CO₂ may require compression prior to onward transmission to the MNZ store. This will be located on the northern end of the Wirral Peninsular.
- 3.2.96 A typical AGI comprises a control kiosk housing electrical equipment and instrumentation, which enable remote monitoring and control of the pipeline. The AGI site also incorporates a range of associated infrastructure, including both above and below ground auxiliary pipework and valves, instrumentation and sensors, cable trays, and electrical transformers. In addition, AGI's would include provision of pigging facilities where required, localised venting. In addition, AGI's would include provision of pigging facilities and where required, localised venting. Provision may be made within the AGI layout for future connection points, allowing for potential system expansion or modification if required. The above ground components will be kept at low level for safety and to reduce visual impact. AGIs may also include compression depending upon the further engineering design which is being undertaken.
- 3.2.97 All AGIs will require connections to be made to the electrical network, and further engineering design work is ongoing in order to determine the exact connections which would be require.
- 3.2.98 AGIs are designed for remote operation and will not be permanently manned. To ensure site security, each AGI may be equipped with CCTV and other detection systems appropriate to the location, but they will not be permanently lit.
- 3.2.99 The footprint required for an AGI varies depending on factors such as pipeline diameter and operational requirements but generally ranges from 5,000m² to 15,000m² (excluding the Coastal

AGI) Appropriate rainwater drainage solutions would be incorporated into each AGI, with specific solutions developed on a case-by-case basis.

- 3.2.100 During construction, a larger temporary working area will be needed to accommodate construction activities and equipment. Upon completion of construction and commissioning, these temporary areas will be reinstated to their original condition.
- 3.2.101 At the end of its operational life, the AGI will be decommissioned following regulatory guidelines and environmental best practices to safely disconnect the AGI from the pipeline network and dismantling inspection facilities, valves, instrumentation, and support structures.
- 3.2.102 Decommissioning will be planned to minimise environmental impact and ensure compliance with all applicable legal and safety requirements. A Decommissioning EMP would be developed to help ensure all required environmental measures are implemented.

Block Valve Stations

- 3.2.103 Block Valve Stations (BVS) are essential facilities along the pipeline, each housing a block valve that enables the isolation of specific pipeline sections. This isolation capability is crucial for carrying out maintenance activities or responding swiftly in the event of an emergency. Early detection systems, typically installed along the pipeline, continuously monitor for potential faults and can pinpoint their location. If an issue is detected, the relevant block valve can be remotely operated to isolate the affected section, ensuring safety and minimising disruption.
- 3.2.104 Each BVS is equipped with a local bypass, which supports start-up procedures and facilitates maintenance operations.
- 3.2.105 The primary functions and features of BVS include:
- Enabling system isolation for maintenance or emergency response;
 - Providing continuous remote monitoring of pipeline operation and condition;
 - Incorporating telemetry systems to allow remote operation of control valves; and
 - Enhancing protection against loss of containment.
- 3.2.106 The typical footprint required for a Block Valve Station is approximately 1,500 m² to 2,500 m². During construction, a larger temporary working area may be needed to accommodate construction activities and equipment. Upon completion of construction and commissioning, these temporary areas will be reinstated to their original condition.
- 3.2.107 BVS are designed for remote operation and will not be permanently manned. To ensure site security, each BVS may be equipped with CCTV and other detection systems appropriate to the location, but they will not be permanently lit.
- 3.2.108 At the end of their operational life, the BVSs will be decommissioned in accordance with regulatory and environmental guidelines and will be planned to minimise environmental impact and ensure compliance with all applicable legal, safety, and environmental requirements.

Cathodic Protection (CP Cabinets)

- 3.2.109 A cathodic protection (CP) system is typically installed to safeguard the pipeline against corrosion. Most of the CP system, including cabling and ground beds, are buried below ground and installed concurrently with the new pipeline. Above ground CP transformer rectifier cabinets (CP cabinets) are positioned at intervals along the pipeline route.

- 3.2.110 These cabinets are generally prefabricated, delivered to site, and measure approximately 1 m high by 1.0 m long and 0.5 m wide. They are usually mounted on concrete plinths for stability and protection.
- 3.2.111 In addition to the CP cabinets, the system includes CP test posts, which are installed above ground. These test posts are typically located within AGIs and BVSs, as well as near road, river, and rail crossings—directly above the pipeline and positioned within verges where possible to minimise disturbance to existing land uses. The precise locations of test posts are determined during the detailed design phase, once the final pipeline route has been confirmed.

Marker Posts

- 3.2.112 For clear identification and safety, marker posts are installed along pipeline routes at all roads, rail, river, and canal crossings, as well as at changes in pipeline direction and field boundaries.
- 3.2.113 The precise number, location, and design of the marker posts will be determined during the detailed design phase, in accordance with industry standards. Wherever possible, they will be positioned to minimise disruption to land use, such as at field boundaries or within verges.
- 3.2.114 In addition to ground-level markers, the pipeline route may also be identified with aerial marker posts and installed at intervals of approximately 1 km and, or at significant changes in pipeline direction. These aerial markers are intended to assist with helicopter inspections and will also be located at field boundaries where feasible.



Plate 3-5: Marker Post

Fibre Optic Cable

- 3.2.115 Fibre optic cables are sometimes installed into the same trench as the pipeline or in a separate trench for communication between AGI/BVSs and or to provide an early warning detection system against threats (such as external damage via unauthorised digging) for pipeline integrity management during operation.

Coastal AGI to MLWS Pipeline(s)

Coastal AGI

3.2.116 The Coastal AGI will be required to enable injection of the CO₂ from the Peak Cluster into depleted gas fields, North or South Morecambe. Two zones for the Coastal AGI are being explored within the northern area of the Wirral Peninsula. Both zones ('landfall zone' and 'inland zone') are included within the Scoping Boundary. The Coastal AGI will serve as the starting point for CO₂ transportation to offshore storage. The amount of compression required is subject to ongoing engineering design. If the amount of compression required is substantially reduced, then the location at the landfall zone may become more suitable.



Plate 3-6: Landfall and Inland Zones

3.2.117 The overall layout of the Coastal AGI is subject to further engineering design, but key elements will comprise:

- Compressor and associated equipment;
- Venting, including a stack of up to 50 m high and 1m wide (worst case);
- Parking, access and maintenance routes for the Coastal AGI;
- New utility infrastructure or reinforcements to existing networks. Power is expected to be provided via a new connection to the local network at Birkenhead. National Grid will undertake the design of this connection, which will be consented separately. A DNO sub-station will be required as part of the DCO application and is likely to be able to be accommodated within the 300 m x 180 m;

- Landscaping and drainage areas, including biodiversity enhancements;
- Normal operational lighting, emergency lighting and escape lighting;
- Welfare facilities for maintenance and operations personnel;
- Control centre;
- Pipeline and pigging facilities;
- Metering; and
- Drainage / utilities.

3.2.118 The Coastal AGI will operate continuously (24/7) to support CO₂ transmission. Permanent operations and security staffing should be assumed at this stage, as well as intermittent staff for inspection and maintenance.

3.2.119 Venting will be required for two principal purposes:

- *Planned maintenance operations* – to safely remove CO₂ from equipment prior to breaking containment for inspection, servicing, or replacement;
- *Emergency situations* – to release CO₂ from pressurised systems in the event of an unplanned over pressurisation or other abnormal operating. Although provision for emergency venting will be incorporated into the design for safety reasons, such events are not expected as the proposed approach is to lock in CO₂ within the system rather than vent to atmosphere.

3.2.120 The Coastal AGI is the contractual location between Peak Cluster CCS and MNZ. This contractual location will serve as the starting point for CO₂ transportation to offshore storage.

Construction works

3.2.121 The construction of the Coastal AGI will take approximately 16 to 18 months. The key construction activities will include:

- Site preparation;
- Earthworks;
- Civil construction;
- Equipment installation which can occur in parallel with construction;
- Heavy lifting;
- Piping and E&I installation can occur in part, with equipment installation; and
- Testing and commissioning.

3.2.122 Equipment such as metering skids, analysers, and vent stacks can be delivered using standard transport and lifting techniques. The same construction activities above would be required regardless of the level of compression.

3.2.123 The compound for the Coastal AGI could be accommodated within the 300 m x 180 m site area.

3.2.124 Once construction is complete, all temporary construction compounds would be removed and the land reinstated to its original condition.

Decommissioning

- 3.2.125 At the end of its operational life, the Coastal AGI will be decommissioned following regulatory guidelines and environmental best practices to safely disconnect the Coastal AGI from the pipeline network and dismantling pigging facilities, valves, instrumentation, and support structures.
- 3.2.126 Decommissioning will be planned to minimise environmental impact and ensure compliance with all applicable legal and safety requirements. A Decommissioning EMP would be developed to help ensure all required environmental measures are implemented.

Coastal AGI to MLWS Pipeline(s)

- 3.2.127 Up to two pipelines of 42" diameter will be required. The length of the onshore section of pipeline will vary depending on the location of the Coastal AGI and location of the landfall but is likely to range from approximately 2.4 to 3.8 km (distance is measured from Coastal AGI to landfall).
- 3.2.128 The pipeline(s) from the Coastal AGI to MLWS could be dense phase, rather than gas phase, which could give rise to different design, construction and operational effects from the rest of the pipeline. Dense phase operations would be in later years of the operational life.
- 3.2.129 The pipeline will operate continuously (24/7) to support CO₂ transmission. Maintenance activity will be limited to regular inspections and pigging.
- 3.2.130 Post construction, the area excavated to lay the underground pipeline will be reinstated to its original condition.

Landfall Zone

- 3.2.131 The landfall zone identified is within the approximately 500 m gap at the shoreline between the Park Lane Holiday Homes and Leasowe Lighthouse. The specific landfall location within this zone has not yet been determined. If the Coastal AGI is located at the inland zone, no operational compound will be required at the landfall zone – only a temporary construction compound.

Pipeline – Landfall to MLWS

- 3.2.132 The DCO extends to MLWS and a deemed marine licence (DML) is proposed to be included within the DCO application. For context, the total distance from landfall to the North Morecambe and South Morecambe stores is approximately 66 km. The approximate length of landfall to MLWS pipeline (i.e. within the DCO) is approximately 2 km.
- 3.2.133 Between landfall and MLWS, or nearshore, it is anticipated that a block valve may be required, which could be on the seabed. If required, its construction would require piling. Further design work is being progressed to confirm whether a nearshore block valve is required at this location.

Construction of the pipeline(s) from Coastal AGI to the Landfall Zone

- 3.2.134 Given the environmental sensitivities of the area, careful consideration will be given to the proposed construction methods. All works will be undertaken in accordance with industry best practice and relevant UK regulatory requirements, ensuring full compliance with all statutory obligations.
- 3.2.135 It is anticipated that the pipelines would be constructed concurrently. Construction is anticipated to take up to 9 months to complete for this section of the pipeline(s) (Coastal AGI to Landfall zone construction compound). This will be further defined as FEED and consenting progresses.

3.2.136 The approach to the open-cut trench installation and the trenchless installation of this section of the pipeline(s) will be as per the “Peak Cluster Pipeline Construction” section of this Proposed Development Chapter. The construction corridor width is likely to be 50-100m for up to two pipelines.

Construction of the pipeline(s) from Landfall zone construction compound to MLWS

3.2.137 From landfall zone construction compound to MLWS, a mixture of trenchless pipe construction (either HDD, Direct Pipe or Micro-tunnelling) with a section of open cut trench is the expected construction technique. The trenchless section will run from the landfall zone construction compound, beneath the Wallasey Embankment exiting at approximately 1km. Beyond this, the pipeline(s) construction will be a nearshore open-cut trench installation down to MLWS (circa 2 km from landfall).

3.2.138 Construction is anticipated to take up to 9-12 months to complete for this section of the pipeline (landfall construction compound to MLWS) depending on the construction technique used. This will be further defined as FEED and consenting progresses.

3.2.139 For the trenchless construction, an onshore entry point will be on land at 3 m-5 m elevation, approximately 50-100 m from the Wallasey Embankment.

3.2.140 If the Coastal AGI is located in the inland zone, a construction compound will be required for the landfall. If it is located in the landfall zone, the construction compound can form part of the future operational compound for the Coastal AGI. The exact size and scale of construction compound will depend on multiple factors and will be defined at later design stages but is envisaged to comprise:

- Secure fencing;
- Hardcore or sealed surfaces and drainage;
- Welfare facilities;
- Site offices; and
- Equipment/plant storage.

3.2.141 Laydown areas will be required, but the exact size and location are currently unknown. However, the extents of the temporary land take required during pipeline construction for access, temporary working areas including pipe lay down areas, offices and compounds would be within the Scoping Boundary.

3.2.142 The nearshore open-cut trenchless section will extend from the exit point to MLWS. The trenching will require a corridor to be cut and sheet piled for the full length. The width and depth of the trench is still to be determined but they will be located within the 50-100m construction corridor.

3.2.143 The MLWS mark is the DCO boundary. For context, beyond MLWS (outside of the scope of this DCO) , excavation will involve either a jack up or barge mounted excavator/vacuum dredger suitable for the shallow waters. The offshore trench will extend to approximately 6 km, to achieve a water depth suitable for an offshore lay vessel.

- 3.2.144 The pipeline for the landfall will be installed from an offshore lay barge at approximately 6 km from shore. The pipe will be pulled to shore through the trench and trenchless bore hole from onshore.
- 3.2.145 For the works proposed beyond MLWS, including the construction and operation of the pipelines, Spirit Energy will seek the necessary permissions from OPRED under the Offshore EIA Regulations 2020 and the Marine Management Organisation (MMO) under the Marine and Coastal Access Act 2009 (MCA Act 2009)).

Decommissioning of the pipeline

- 3.2.146 The decommissioning of the pipeline will be developed as part of the next design stage. However, at the end of the operating life, the pipeline would be decommissioned safely and left in-situ in line with current UK industry practice. All above ground structures will be removed and land restored to its previous use. A Decommissioning EMP would be developed to help ensure all required environmental measures are implemented.

3.3 Rochdale Envelope and Design Parameters

- 3.3.1 The Planning Inspectorate's Advice Note 9: Using the 'Rochdale Envelope' (Ref 3-2), provides guidance regarding the degree of flexibility that may be considered appropriate within an application for development consent under the PA2008 (Ref 3-3). The advice note acknowledges that there may be aspects of a proposed project design that are not yet fixed, and therefore, it may be necessary for the EIA to assess likely credible worst-case variations to ensure that all foreseeable significant environmental effects of a project have been assessed.
- 3.3.2 NPS EN-1 (Ref 3-6) provide further guidelines on flexibility and in justifying the amount of design detail contained within an application, stating in Section 4.3.12 *"Where some details are still to be finalised, the ES should, to the best of the applicant's knowledge, assess the likely worst-case environmental, social and economic effects of the proposed development to ensure that the impacts of the project as it may be constructed have been properly assessed"*.
- 3.3.3 The National Infrastructure Planning Association (NIPA) has published reports, such as its first Insights Report entitled 'Balancing detail and flexibility - through planning to delivery' (Ref 3-7) on striking the right balance between design detail and flexibility in DCOs and their recommendations for best practice will be considered in preparing the DCO application, and Insights II instigated to review progress against the Insights I recommendations (Ref 3-8).
- 3.3.4 It is prudent to maximise flexibility given the long lead in times to consent and subsequent engagement of EPC (engineering, procurement, and construction) contractors. This is particularly the case under the PA2008 where the process for post consent amendments can add unnecessary costs and delays to project delivery. It is typical for a DCO (especially linear schemes) to envelope the final design of a scheme by using (inter alia) parameters and "limits of deviation" to define the consent within which the detailed design is developed. For the Proposed Development pipeline, the order limits are expected to be set at around 100 m wide, with a typical construction working width corridor of 30 to 40 m and additional working width needed at some crossings, for example where HDD compounds are required. For the Capture Facilities, where detailed engineering design has yet to be completed, it may be necessary for a series of parameters to be identified, which could for example provide details on maximum massing and heights, or on maximum operational emission levels. Further details would be provided within the ES, ensuring that reasonable worst case assessments parameters are used.

- 3.3.5 This EIA Scoping Report is based on the emerging preliminary design for the Proposed Development available at the time of preparation, as described below. The design of the Proposed Development will evolve further through a series of design stages which will form the basis for future Consultation and then the DCO application. It is understood that if any significant changes occur, there may be a need to re-consult and request a new scoping opinion.
- 3.3.6 Design parameters will be developed for Statutory Consultation and presented in the Preliminary Environmental Information Report (PEIR). Final parameters and limits of deviation will be presented in the ES, draft order and works plans.

3.4 Design Evolution and consideration of alternatives

- 3.4.1 Schedule 4 of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (Ref 3-4) states that an Environmental Statement (ES) should include:
- "A description of the reasonable alternatives (for example in terms of development design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects."*
- 3.4.2 Whilst there is no statutory requirement to include an assessment of alternatives in support of a request for a Scoping Opinion, the Planning Inspectorate's Advice Note Seven (Ref 3-5) recommends that a Scoping Report includes *"an outline of the reasonable alternatives considered and the reasons for selecting the preferred option"*.
- 3.4.3 The area depicted as the Scoping Boundary (Figure 1.2) reflects the areas potentially required for the infrastructure associated with the Proposed Development, as well as the corridor within which the pipelines would be routed. The Scoping Boundary has been identified following optioneering work undertaken by the Applicant. This has been summarised below.

Strategic Options

- 3.4.4 Strategic alternatives were developed to allow the identification of the potential landfalls and Strategic Opportunity Corridor (SOC) between sources of CO₂ from the Peak Cluster partner sites and the MNZ transportation and storage facilities in the East Irish Sea. The SOC options are wide corridors within which a CO₂ pipeline could be routed. The identification of the landfalls and SOC options were guided by a selection of environmental, land and engineering constraints and focused on the North West of England and North Wales and their coastlines.
- 3.4.5 From the potential SOC options identified, corridors were generated that avoided, where possible, environmental, land and technical constraints. All options started at each of the Peak Cluster partner locations, and this resulted in some common corridors for all strategic options including:
- Peak District National Park (PDNP): Unavoidable corridor from the Breedon Hope cement plant through the PDNP before passing through a gap in the PDNP near to Chapel-en-le-Frith; and
 - the South Pennine Moors SPA and SAC which surrounds some of the Peak Cluster partners.
- 3.4.6 Once the SOC options were identified, each one was evaluated, which led to the conclusion that the Wirral be chosen as the preferred landfall and SOC option. This was because it best met the Project Value Measures and in so doing is the option best aligned to the tests within the NPS. It meets the tests set out in the NPS in the following ways:

- It minimises interaction with National Parks (except for the unavoidable section of the PDNP which is common to all SOC options) and National Landscape areas, which have the highest status of protection in relation to landscape and natural beauty (other than a short, unavoidable, connection to the Breedon site), in line with NPS EN-1;
- It minimises potential for impacts to International Conservation Designations, which are afforded the highest level of biodiversity protection, through use of trenchless techniques to minimise works within the Dee Estuary SAC, in line with NPS EN-1;
- It minimises impacts upon BMV agricultural land (defined as land in grades 1, 2 and 3a of the Agricultural Land Classification), through routeing to avoid grade 1 land, where possible; and
- It avoids substantial harm to, or loss of significance of assets of the highest significance, through the avoidance of direct impacts upon high value heritage assets, in line with NPS EN-1.

Pipeline Routeing

- 3.4.7 Following the development of the strategic options, a pipeline corridor was identified within an area of search (Plate 3-10) following a process of identifying and optimising pipeline corridor route options, selecting a preferred corridor for the pipeline system.
- 3.4.8 Important environmental and planning constraints, and their policy requirements were considered to inform the pipeline routing. This included international conservation designations (SAC, SPA and Ramsar), designated landscapes – National Park and AONBs, National Conservation Designations including SSSI, and National Nature Reserves (NNR), Ecological features (ancient woodland and priority habitats), high value heritage assets, Grade 1 or 2 agricultural land, water resources and the water environment (rivers, canals, lakes, wetlands, reservoirs, ponds and groundwater), flood risk, green belt, green space and open space, and peat soils.
- 3.4.9 From an engineering perspective the routing exercise considered built infrastructure and land use constraints which could add excessive risk to construction and/or cause difficulties. Key engineering constraints included major highway crossings, rail line crossings, major watercourse crossings, ground conditions, densely populated areas, existing / future and built developments, gas pipelines, overhead power lines, minerals / mining extraction / landfill sites and Ministry of Defence land.

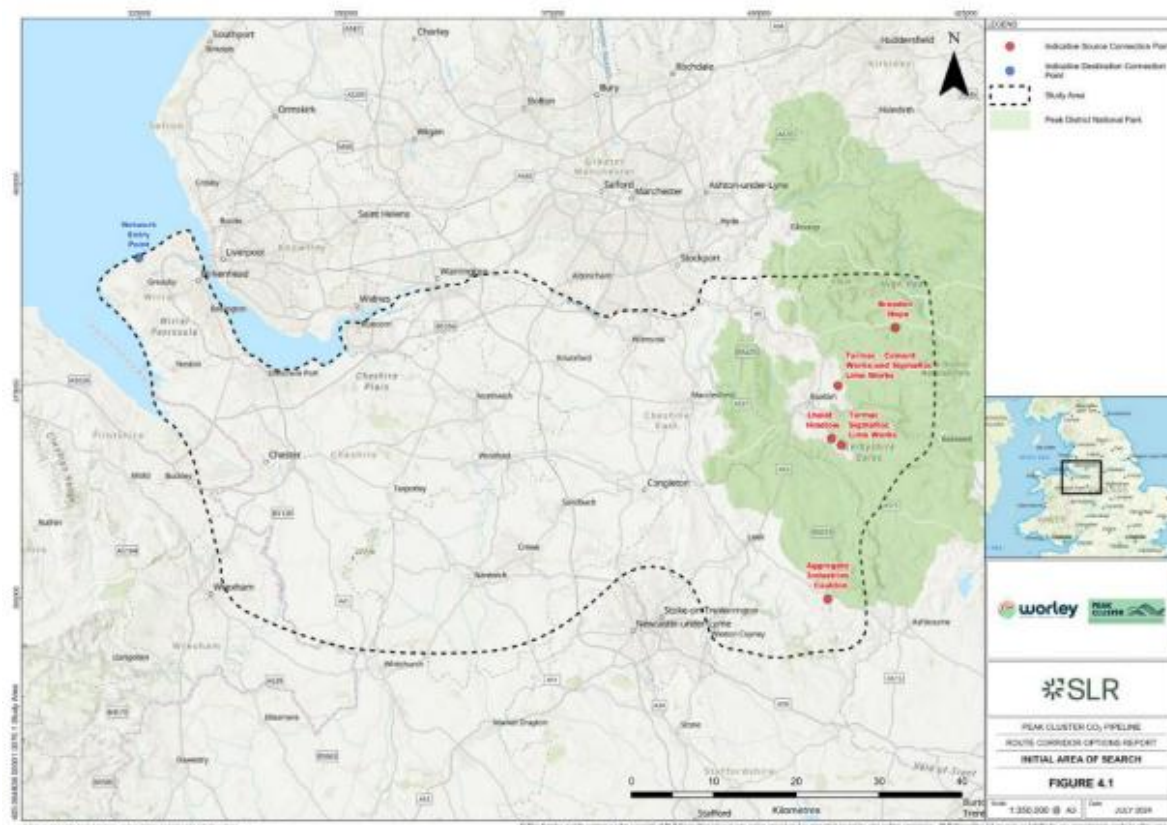


Plate 3-7: Initial Area of Search

- 3.4.10 All options start at each of the Peak Cluster partner site locations and finish at the Wirral landfall zone. This results in some common pipeline routes namely:
- Hope Cement Works Feeder Pipeline;
 - Tunstead Tarmac Cement and SigmaRoc Lime Works Feeder Pipeline;
 - Hindlow Lime Works Feeder Pipeline;
 - Peak District North Feeder Pipeline Route to Northwest of Macclesfield; and
 - Cauldon Cement Works Feeder Pipeline.
- 3.4.11 All pipeline route options discussed above converge at the entrance to the Wirral just to the north-east of Chester and included a number of alternative routes.
- 3.4.12 These were assessed against the Project Value Measures, which resulted in the discount of the North Corridor Route as both the Central and South Corridor routes performed better. The central and southern routes performed similarly and were both considered further in conjunction with targeted engagement with stakeholders.
- 3.4.13 The Central Corridor, though feasible, presented more engineering challenges and was marginally less cost-effective. Both the Central and South corridors were noted to pass through the Cheshire Brine Subsidence Board Consultation Zone, with further investigation recommended to confirm the risk from historical mining activities. Additionally, the presence of the Jodrell Bank consultation zone posed a significant risk factor for the Central route, requiring further engagement with the University of Manchester to clarify potential issues related to radio frequency interference and planning restrictions.

- 3.4.14 Engagement was undertaken with local authorities, PDNP Authority, EA, Natural England, Historic England, Cheshire Brine Subsidence Compensation Board, HS2, National Trust and University of Manchester (Jodrell Bank).
- 3.4.15 Through this engagement it was identified that the south route carries a greater risk of encountering challenging ground conditions than anticipated during the initial pipeline routing studies, whilst the risk for the Central route is less than previously anticipated. The risk associated with the Jodrell Bank Consultation Zone is considered to be negligible in the absence of significant above ground infrastructure being required inside the zone.

Additional Changes ahead of selection of the Scoping Boundary

- 3.4.16 Additional changes occurred to the Proposed Development after the completion of those initial routing studies which required a further review of the preferred route to be taken forward. Key changes to the project included:
- Lhoist formally withdrew from Peak Cluster and its Hindlow site will no longer be connected as part of the project to be consented under the Peak Cluster CCS Pipeline DCO; and
 - Buxton Lime has concluded that it will not build a carbon capture facility at its Hindlow site, instead consolidating processing at its Tunstead site.
- 3.4.17 As a result of this, there will be no capture facilities at Hindlow and the pipeline spur, measuring approximately 16km from Hindlow to the AGI connecting to the Tunstead pipeline is no longer required.
- 3.4.18 In addition to the above, further design work has been undertaken focussing on the Central Corridor Route. This work included further detailed environmental and engineering routing work which resulted in a number of changes to the initial central routing pipeline corridor routing. The key design changes which occurred and have been fed in directly to the defined Scoping Boundary include:
- The addition of an alternative southerly route for the pipeline, to the south of Lyme Park;
 - The addition of an alternative pipeline route around the Hare Hill (National Trust) area;
 - Moving the pipeline route further to the west of Macclesfield, to avoid safeguarded land; and
 - Identification of initial search areas for key AGI locations.
- 3.4.19 At this stage of the Proposed Development's design, the exact locations of a number of permanent (e.g. AGIs and BVSSs) and temporary components (e.g. Construction compounds) are yet to be established, but they are envisaged to be located within the Scoping Boundary as presented within this Scoping Report. Further detailed engineering and environmental work is currently being progressed and information around the chosen locations will be presented within the PEIR and ES.
- 3.4.20 A full description of the design evolution and assessment of alternative options will be presented in detail in the Assessment of Alternatives in the PEIR and ES.

Alternative technology for Capture Facilities

- 3.4.21 As has been outlined in the above section related to the capture facilities, at this stage, the final technology selection for the capture facilities have not been made for all of the facilities. The Applicant is considering a range of licensed CO₂ capture technologies and further detailed engineering and environmental work is ongoing to help select the most suitable solution for each facility. A "Do-Nothing" Scenario would also be included within the ES assessment.

3.5 References

- Ref 3-1** UK Onshore Pipeline Operators Association (UKOPA). Good Practice Guide – Pipeline Decommissioning and Abandonment (UKOPA/GPG/038). Available at: <https://ukopa.co.uk/document/pipeline-decommissioning-and-abandonment/>
- Ref 3-2** Planning Inspectorate (2018) Advice Note 9: Using the ‘Rochdale Envelope’. Available at: <https://www.gov.uk/government/publications/nationally-significant-infrastructure-projects-advice-note-nine-rochdale-envelope> -
- Ref 3-3** HM Government (2008) Planning Act 2008. Available at: <https://www.legislation.gov.uk/ukpga/2008/29/contents>
- Ref 3-4** HM Government (2017). The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017. Available at: [The Infrastructure Planning \(Environmental Impact Assessment\) Regulations 2017](https://www.legislation.gov.uk/uksi/2017/1211/contents/made)
- Ref 3-5** Planning Inspectorate (2020). Advice Note Seven Environmental Impact Assessment: process, preliminary environmental information and environmental statements. Available at: <https://www.gov.uk/government/publications/nationally-significant-infrastructure-projects-advice-note-seven-environmental-impact-assessment-process-preliminary-environmental-information-an>
- Ref 3-6** Department for Energy Security & Net Zero (2025). Overarching National Policy Statement for energy (EN-1). Available at: <https://assets.publishing.service.gov.uk/media/65bbfbd7c709fe1000f637052/overarching-nps-for-energy-en1.pdf>
- Ref 3-7** NIPA (2017). NIPA Insights I Balancing detail and flexibility - through planning to delivery. Available at: https://nipa-uk.org/wp-content/uploads/2023/08/Insights_FinalWeb.pdf
- Ref 3-8** NIPA (2019). NIPA Insights II Towards a Flexibility Toolkit. Available at: https://nipa-uk.org/wp-content/uploads/2023/08/NIPA_Insights2_D4b_PRINT_1.pdf

4. EIA Approach and Methodology

4.1 Introduction

- 4.1.1 This chapter of the Scoping Report sets out the proposed overarching approach to the environmental impact assessment (EIA) for the Proposed Development. This section has been informed by current best practice guidance, as set out within PINS Advice Note 7 Environmental Impact Assessment: process, preliminary environmental information and environmental statements (Ref 4-1).
- 4.1.2 EIA is the process of identifying, evaluating and mitigating the likely significant environmental effects of a project. It promotes the early identification and evaluation of the likely significant environmental effects and enables appropriate mitigation (that is, measures to avoid, reduce or offset significant adverse effects) to be identified and incorporated into the design of the development, or commitments to be made to environmentally sensitive construction methods and practices.
- 4.1.3 The EIA will be reported in an Environmental Statement (ES), containing the information required by Regulation 14(2)(a-f) of the Infrastructure Planning (EIA) Regulations 2017. It will be undertaken and reported by competent experts in line with Regulation 14(4)(a) of the Infrastructure Planning EIA Regulations 2017. This will be demonstrated in the ES with a statement outlining the qualifications and experience of the EIA team.
- 4.1.4 The proposed Structure of the ES and some supporting narrative on the approach is presented within Section 20.2, Chapter 20 of this document. Importantly, the ES is structured to allow the presentation of impacts associated with each of the key components to be clearly presented, whilst also ensuring the overall impacts associated with whole Proposed Development are assessed and presented.

4.2 Stakeholder Engagement and Consultation

Context

- 4.2.1 Effective stakeholder engagement and consultation is intrinsic to the PA2008 (Ref 4-2) and will be fundamental to the success of the Proposed Development.
- 4.2.2 The process of consultation is critical to the development of a comprehensive and balanced ES. The views of statutory and non-statutory consultees serve to focus the environmental studies and to identify specific issues that require further investigation. Consultation is an ongoing process, which enables mitigation measures to be incorporated into the design of the Proposed Development, thereby limiting adverse effects and enhancing environmental benefits.
- 4.2.3 The Proposed Development has a wide range of stakeholders (including landowners, statutory/prescribed consultees, local communities and specialist interest groups) with differing interests that will require varied levels of consultation. Specific communication activities therefore need to be focussed to meet the needs of specific individuals and groups. This requires an understanding of the stakeholders and their interests in the Proposed Development.
- 4.2.4 Stakeholder engagement for the Proposed Development is based on the following core principles:
- Early and ongoing engagement to inform and influence the design process;

- Seeking feedback in the iterative design process and taking this feedback into consideration;
- Building of long-term relationships with key stakeholders throughout the different stages of the Proposed Development to help better understand their views;
- Where possible and practicable ensuring concerns are addressed; and
- Ensuring appropriate statutory consultation is undertaken in compliance with requirements of the PA2008 (Ref 4-2), the Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009, EIA Regulations (Ref 4-3) and associated guidance.

DCO Consultation Requirements

- 4.2.5 The DCO process has several statutory requirements regarding consultation. These requirements stipulate that certain stakeholder groups and the community must be consulted as part of the pre-application process, as set out in Sections 42, 47 and 48 of the PA2008 (Ref 4-2) regulation 3 and Schedule 1 of the Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 and Regulation 13 of the EIA Regulations (Ref 4-3). Further requirements set out how the Proposed Development and application must be publicised, and specific documents produced, including a Statement of Community Consultation (SoCC), Preliminary Environmental Information (usually in the form of a Preliminary Environmental Information Report (PEIR)) and a Consultation Report.
- 4.2.6 Whilst various elements of the Planning and Infrastructure Act 2025 amend the statutory requirements in place, the Applicant is still committed to undertaking appropriate levels of consultation and providing proportionate environmental information to support any engagement.

Consultation to Date

- 4.2.7 The Applicant commenced engagement activities in 2022. This has included a series of presentations and webinars providing project introduction and awareness, project update, project launch, and later, seeking feedback on pipeline route options. These meetings have been held with a variety of regional bodies, including statutory environmental bodies, government bodies, including MPS and Local Authorities, companies, local authorities and community groups. In particular, meetings have been held with:
- Environment Agency;
 - Natural England;
 - Historic England;
 - Marine Management Organisation;
 - Cheshire West and Chester Council;
 - Cheshire East Council;
 - Peak District National Park Authority;
 - High Peak Borough Council;
 - Derbyshire Dales District Council;
 - Staffordshire Moorlands Council;
 - Derbyshire County Council;

- Staffordshire County Council;
- Nature North;
- Cheshire Wildlife Trust;
- Derbyshire Wildlife Trust; and
- National Trust.

EIA Scoping Consultation

- 4.2.8 The Planning Inspectorate (on behalf of the SoS) will consult on this Scoping Report under the EIA Regulations (Ref 4-3). Views from consultees will be considered and used to inform the Scoping Opinion to be issued by The Planning Inspectorate (on behalf of the SoS).
- 4.2.9 Under Regulation 10(6) of the EIA Regulations (Ref 4-3), the SoS must undertake consultation with statutory consultation bodies, including environmental bodies (such as Natural England, the EA and Historic England) and relevant planning authorities before adopting a Scoping Opinion.

Further Public Consultation

- 4.2.10 In accordance with Section 47(1) of the PA2008 (Ref 4-2) for an NSIP, the Applicant will prepare a Statement of Community Consultation (SoCC). This will outline how the Applicant intends to consult with the local community about the Proposed Development, including in accordance with Regulation 12 of the EIA Regulations (Ref 4-3), and how it intends to publicise and consult on the PEIR. The Applicant is required to consult the host local authorities (i.e., those local authorities within whose administrative area the Proposed Development is located) on the draft SoCC and they will have a period of at least 28 days following receipt of the request to comment on a draft SoCC prior to its publication for inspection by the public.
- 4.2.11 A two-stage approach to consultation with the local community and wider public is planned, as follows:
- A first round of consultation events in Q1 of 2026 to introduce the Proposed Development and present a preliminary design and the options previously considered; and
 - A second round of events in Q4 of 2026, consisting of the Statutory Consultation pursuant to the PA2008 (Ref 4-2) and EIA Regulations (Ref 4-3) including consultation on the PEIR. The PEIR will report the outcomes of the preliminary assessment of likely significant environmental effects.
- 4.2.12 In addition, a further round of targeted consultation would be undertaken if it is deemed necessary following any changes which are made following Statutory Consultation.
- 4.2.13 The approach to public consultation will include (without being limited to):
- Exchanges of correspondence, meetings and workshops with local community groups and businesses (online or in person as appropriate);
 - The use of a Virtual Public Consultation Room, available for online interaction providing information on the Proposed Development and update on progress;
 - Public exhibitions at several venues across the suggested route, where members of the community can view information about the Proposed Development and meet with members of the Project team; and

- Use of social media and media channels, as well as public affairs engagement with key elected representatives.
- 4.2.14 Consultation will also be undertaken with prescribed stakeholder bodies and affected landowners, in accordance with Sections 42 and 48 of the PA2008 (Ref 2) regulation 3 of the Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 and Regulation 13 of the EIA Regulations (Ref 4-3). Topic specific technical and procedural engagement will continue throughout the EIA process.
- 4.2.15 All responses received during consultation will be carefully considered and, where appropriate, taken into account in the design evolution of the Proposed Development in accordance with Section 49 of the PA2008 (Ref 4-2). Details of any responses received during consultation and the account taken of those responses will be included in a Consultation Report. This Consultation Report will be submitted with the DCO application, and if the application is accepted, will be available for public review.
- 4.2.16 The Consultation Report will demonstrate how the Applicant has complied with the consultation requirements of the Planning Act 2008 (Ref 4-2) and EIA Regulations (Ref 4-3) and will be considered by the SoS when determining whether to accept the application, and then in examining the application.
- 4.2.17 A summary of the public consultation undertaken will be included within the ES and technical stakeholder engagement will be summarised within the individual technical chapters. In addition, the Applicant will aim to agree Statements of Common Ground (SoCGs) with key stakeholders to set out matters that have been agreed during consultation, with draft SoCGs submitted as part of the DCO Application.
- 4.2.18 The Applicant is mindful that fundamental reform to the pre-application consultation obligations for NSIP applicants are proposed pursuant to the Planning and Infrastructure Bill. Once the final detail of these changes is certain, together with any statutory guidance, the Applicant will consider to what extent it may alter its approach to consultation, compared to the current legal requirements. Its current expectation is that it will carry out a two staged consultation in any event.

4.3 Scoping Boundary

- 4.3.1 The Scoping Boundary identified within this report has been developed on the basis of including the following components of the Proposed Development:
- Breedon Capture Facility;
 - Tarmac Capture Facility;
 - Buxton Lime Capture Facility;
 - Holcim Capture Facility;
 - Peak Cluster Pipeline;
 - AGIs;
 - BVSs;
 - Coastal AGI; and
 - Coastal AGI to MLWS Pipeline(s).

- 4.3.2 In certain places the Scoping Boundary may be substantially wider than that what will likely form the eventual draft Order Limits that will be applied for and included within the ES, though in a handful of 'pinch points' it is likely to be a reasonable reflection of the Order Limits.
- 4.3.3 At this stage of the Proposed Development's design, the exact locations of a number of permanent (e.g. AGIs and BVSs) and temporary (e.g. construction compounds) components are yet to be established, but they are envisaged to be located within the Scoping Boundary as presented within this Scoping Report.
- 4.3.4 The proposed scope of the EIA is based upon the Scoping Boundary, as it represents all anticipated siting and routing configurations that could be developed within the preferred pipeline corridor and associated development. However, it is worth noting that not all the land identified in the Scoping Boundary will be required.
- 4.3.5 The next step in the process will be to identify appropriate sites for the capture facilities and a proposed pipeline route alignment within the Scoping Boundary. This work is currently on-going and is expected to result in a corridor of approximately 100 m in the draft Order Limits for open trench construction of the onshore pipeline elements, and up to 150 m for the offshore pipeline(s) from the Coastal AGI down to MLWS. The construction working width for these is anticipated to be approximately 30-40 m. However, additional flexibility is required to reduce construction risks, for example to avoid areas of unsuitable ground not picked up by design stage ground investigation, or previously unknown buried archaeology. Hereafter, references to the proposed pipeline route are to that 100 m wide corridor unless otherwise stated.
- 4.3.6 In addition to the draft Order Limits, which will show the flexible area within which the final pipeline can be routed, there will be a need for areas of land for other infrastructure, such as BVSs. These are expected to fall within the identified Scoping Boundary.
- 4.3.7 The Scoping Boundary does not include mitigation land, off-route construction access roads and connections to local utilities that may be required as the locations of these are not yet known, but design work is on-going to identify suitable locations. The Order Limits presented within the ES will however include all land needed temporarily for the safe and efficient construction of the Proposed Development, including land for construction compounds, laydown areas, pipe dumps, temporary haul routes and accesses etc.
- 4.3.8 It is important to note that for any baseline surveys undertaken in the field to support the EIA, these will be based on the preferred route configuration and the associated draft Order Limits which will be developed, unless otherwise stated. It is likely that the draft Order Limits will reduce in size as the design of the Proposed Development progresses and there is more certainty as to the land likely to be required. Where surveys are committed to within the draft Order Limits, or within a certain distance of the draft Order Limits, the Order Limits in question will be those currently anticipated at the point in time when the survey is undertaken. This means that some surveys may eventually become abortive but conversely, if, due to new information (e.g., survey results or stakeholder feedback) the draft Order Limits need to be moved, additional surveys may need to be undertaken to account for the potential gap in survey information.
- 4.3.9 The Scoping Boundary falls within the jurisdiction of the following local planning authorities as shown on Figure 1.3:
- Peak District National Park Authority;
 - High Peak District Council;
 - Staffordshire Moorlands Council;

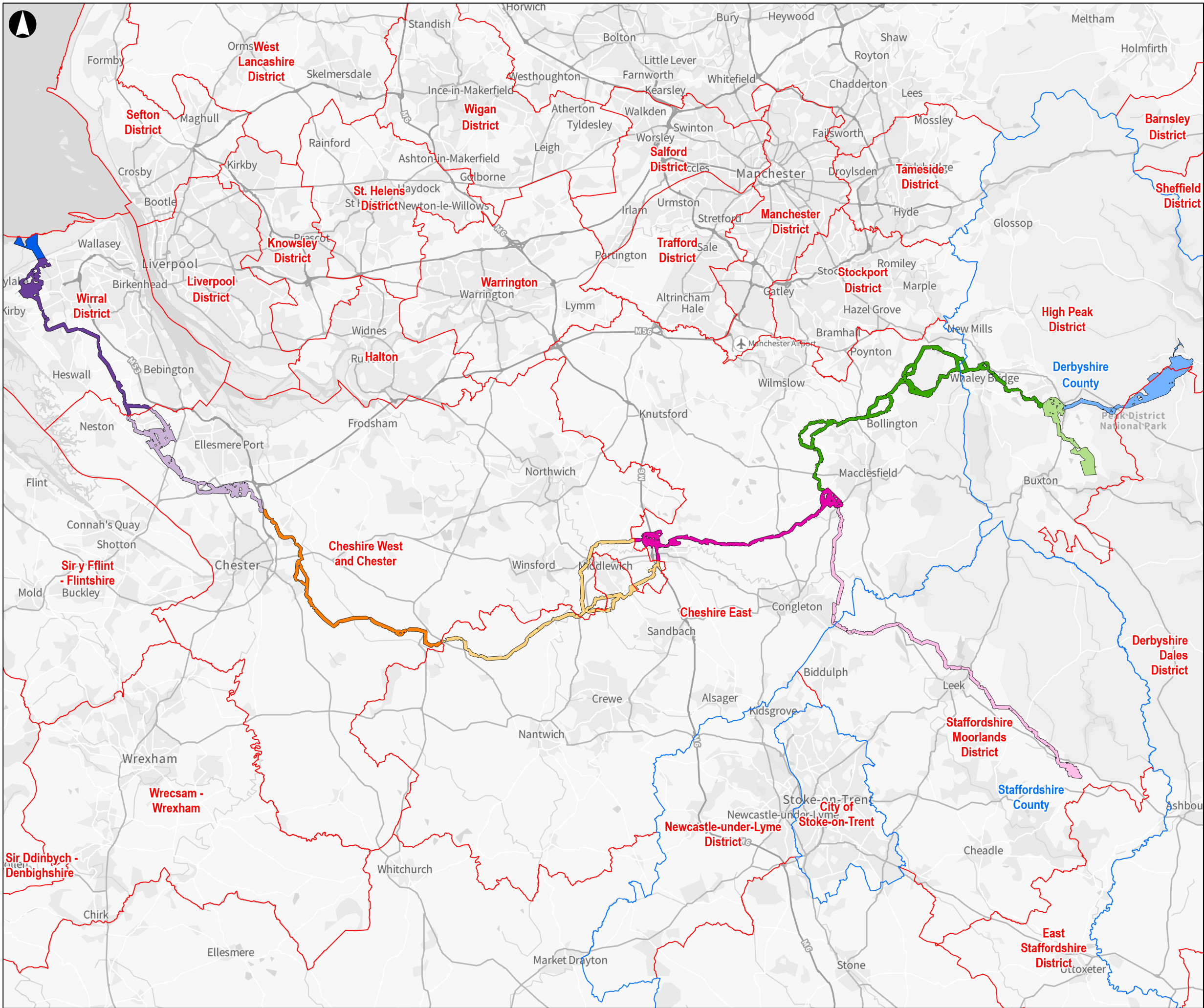
- Derbyshire Dales District Council;
- Staffordshire County Council;
- Derbyshire County Council;
- Cheshire East Council;
- Cheshire West and Chester Council; and
- Wirral Council.

4.3.10 Due to the length of the Peak Cluster Pipeline and pipeline(s) from Coastal AGI to MLWS, where deemed appropriate, the narrative within the Scoping Report has been divided into four main sections which are described in Table 4-1.

Table 4-1: Pipeline Sections used in Scoping Report

Section	Description
Pipeline (East)	Peak Cluster Pipeline from the Capture Facilities to the Central AGI.
Pipeline (Central)	Peak Cluster Pipeline from the Central AGI to the Connection AGI 2 (Near Ellesmere Port)
Pipeline (West)	Peak Cluster Pipeline from the Connection AGI 2 (Near Ellesmere Port) to the Coastal AGI
Coastal AGI to MLWS Pipeline(s)	Pipeline(s) from the Coastal AGI to MLWS at the Wirral Peninsular. This includes the Coastal AGI (landfall zone and inland zone), and pipeline(s) from Coastal AGI to MLWS.

4.3.11 However, in order to present the baseline information and undertake the impact assessment in a manageable way, information on the pipeline route within the PEIR and ES will be based on the pipeline sections as presented in Figure 4-1 and further discussed in Chapter 20. These proposed section breaks are designed around a combination of key AGI locations, along with natural splits in LPA boundaries.



Legend

- District/Unitary Authority Boundary
- County Boundary

Pipeline Section Name

- Section 1 - Breedon (Hope) Capture Facility to North Feeder AGI
- Section 2 - Tarmac & Buxton Lime (Tunstead) Capture Facilities to (and including) North Feeder AGI
- Section 3 - North Feeder AGI to outside the Central Feeder AGI search area
- Section 4 - Holcim (Cauldon) Capture Facility to Central Feeder AGI
- Section 5 - Central Feeder AGI to Byley Lane (Including the Central Feeder and Connection AGI 1)
- Section 6 - Byley Lane to Vale Road (south of Nantwich Road)
- Section 7 - Vale Road to East side of M53
- Section 8 - East side of M53 to Willaston Road (Including Connection AGI 2 and 3)
- Section 9 - Willaston Road to North Wirral Coastal Path (Including the Coastal AGI)
- Section 10 - North Wirral Coastal Path to MLWS



03	02/01/2026	EH	DH	HT	MW

Rev	Date	By	Chkd	Appd	Authd

ARUP **AECOM**

Client



Project Name

Peak Cluster

Scale at A3

1:300,000

Issue Purpose

Scoping Report

Notes
Contains OS data © Crown Copyright and database right 2025
Contains data from OS Zoomstack

Project Number
31220300

Rev
02

Drawing Number

Figure 4.1

Drawing Title

Proposed Development - Pipeline Section Splits

4.4 Approach to Environmental Impact Assessment

Overview

- 4.4.1 The assessment methodology will follow a systematic approach in order to assess the potential impacts and subsequent effects of the Proposed Development on human health, the natural and physical environments and material assets in an appropriate manner, as per the EIA Regulations, 4(2) (Ref 3).
- 4.4.2 The Proposed Development will follow best practice by integrating environmental considerations (and feedback from the consultation process) into the design process at all stages. This has already begun through capture facility siting and pipeline route development comprising both desk studies and baseline surveys that have sought to avoid or reduce disturbance of known environmental constraints and/or receptors, wherever possible.
- 4.4.3 The EIA will identify potentially significant environmental effects and, where necessary, propose project specific mitigation measures to avoid, reduce or offset adverse environmental effects or maximise environmental benefits. These can then be incorporated into the further, post-consent configuration refinement of the Proposed Development.
- 4.4.4 The EIA process involves the main steps illustrated in Plate 4-1.

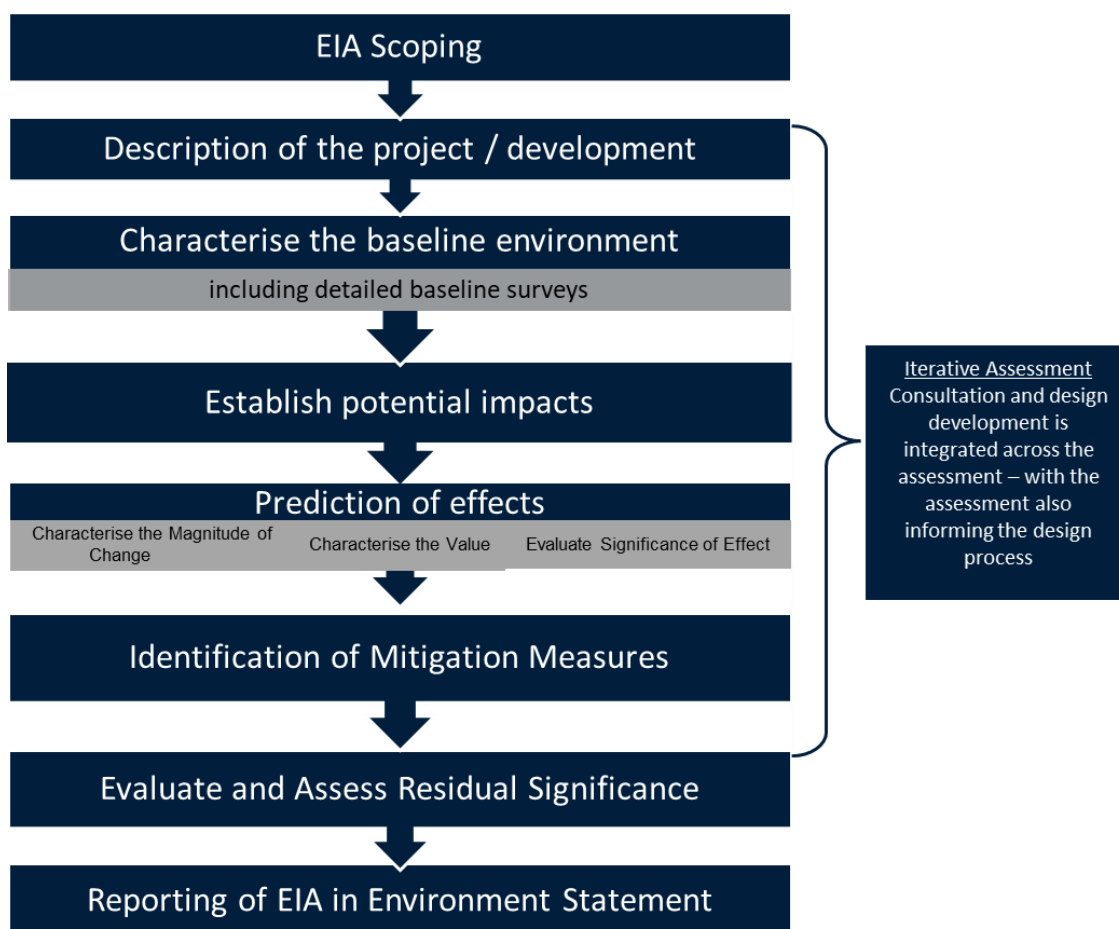


Plate 4-1: Overview of EIA Process

Defining the Study Area

- 4.4.5 A Study Area is defined in each individual technical assessment. A rationale is also provided to support the selection of the Study Areas selected for each technical discipline.

Establishing the Baseline Conditions Data Collection

- 4.4.6 To assess the potential impacts resulting from the Proposed Development it is necessary to first establish the environmental conditions that currently exist along and within the vicinity of the Proposed Development areas.
- 4.4.7 Appropriate understanding of the baseline for each environmental receptor will be collated through some or all of the following:
- Review of secondary sources (desk-based, i.e. review of existing documentation and literature; data searches and available data sets such as GroundSure or EnviroCheck);
 - Undertake primary baseline studies (field); and
 - Stakeholder consultation.
- 4.4.8 The key data sources used to establish the baseline will be described in each technical assessment chapter.

Future Baseline

- 4.4.9 The ES will include an outline of the likely evolution of the existing baseline without the development of the Proposed Development, based on available information on future plans and knowledge of the historic land uses. The future baseline scenario will be clearly set out and described within the ES in the description of the Proposed Development and in each relevant technical chapter.
- 4.4.10 A precautionary approach to the future baseline will be taken in the Air Quality, and Material and Waste Chapters in the ES. This approach is explained in Chapter 5 Air Quality, Section 5.4.14, and Chapter 16 Materials and Waste, Section 16.4.23.

Assessment Scenarios

- 4.4.11 Where relevant, each technical chapter has provided further narrative of the different assessment scenarios that will be assessed.
- 4.4.12 The assessment scenarios will cover the three phases and associated activities and timescales of the Proposed Development:
- Construction (e.g. construction traffic);
 - Operation (e.g. the use and maintenance of the infrastructure); and
 - Decommissioning (construction related activities associated with removal of infrastructure at end of life e.g. construction traffic)
- 4.4.13 Each of these phases will have different activities which are discussed within the technical assessments.
- 4.4.14 The technical assessments provide a narrative on potential significant effects as a result of the activities during the phases, and whether an assessment has been scoped in or out for the EIA. The need for further scenarios will be determined as part of the EIA.

4.5 Assessment of Impacts

- 4.5.1 The Institute of Environmental Management and Assessment (IEMA) guidelines (2004, p11/2) (Ref 4) state that: *“The assessment stage of the EIA should follow a clear progression; from the characterisation of ‘impact’ to the assessment of the significance of the effects taking into account the evaluation of the sensitivity and value of the receptors.”*
- 4.5.2 The prediction of potential impacts will be undertaken to determine what could happen to each environmental receptor because of the Proposed Development and its associated activities. There is expected to be a diverse range of potential impacts to consider within the assessment process and it will likely be appropriate to use a range of prediction methods including quantitative, semi-qualitative and qualitative. The definitions used to describe impacts are noted in Table 4-2, and include beneficial and adverse impacts.

Table 4-2: Impact Definition

Terms	Definition
Direct Impact	Impacts that result from a direct interaction between the Proposed Development activities and the receiving environment.
Indirect Impact	Impacts on the environment, which are not a direct result of the Proposed Development activities, often produced away from the activity or as a result of a complex pathway.
Inter-Project cumulative impact	Impacts that result from incremental changes caused by other present or reasonably foreseeable actions together with the Proposed Development (European Commission 1999). Generally considered to be the same impact but from different projects e.g. noise generated from two separate projects combining to affect residential amenity.
Intra-Project cumulative impact	Multiple impacts that result from the Proposed Development and effect a single receptor such as a local resident affected by dust, noise and traffic disruption during construction.
Beneficial Impact	An impact that is considered to represent an improvement on the baseline condition or introduces a new desirable factor (Chartered Institute of Ecology and Environmental Management (CIEEM) 2010).
Adverse Impact	An impact that is considered to represent an adverse change from the baseline condition or introduces a new undesirable factor (CIEEM 2010).

- 4.5.3 Further guidance specifically relating to the magnitude of change, the sensitivity of a receptor and the significance of any resultant effects is provided in the following sections.

Magnitude of Change

- 4.5.4 General criteria for defining the magnitude of an impact are set out in Table 4-3.
- 4.5.5 Key factors that influence this include:
- *Scale of change* – The scale of change refers to the degree of change to or from the baseline environment caused by the impact being described;
 - *Spatial extent* – The extent of an impact is the full area over which the impact occurs; and

- *Duration and frequency* – The duration is the period within which the impact is expected to last prior to recovery or replacement of the feature. Frequency refers to how often the impact will occur.

Table 4-3: Impact Magnitude Criteria

Magnitude	Criteria
High	Long term and/or regional level loss; or major alteration to key elements/features of the baseline condition such that post development character/composition of the baseline will be fundamentally changed.
Medium	Medium term loss and/or local level change (greater than the Proposed Development's footprint) or alteration to one or more key elements/features of the baseline conditions such that post development character/composition of the baseline condition will be materially changed.
Low	Short term, site specific and/or a minor shift away from baseline conditions. Change arising from the alteration will be detectable but not material; the underlying character/composition of the baseline condition will be similar to the pre-development situation.
Very Low	Very little change from baseline conditions. Change is barely distinguishable, approximating to a "no change" situation.

Sensitivity of the Receptor

4.5.6 The sensitivity of a receptor or feature is characterised by the vulnerability to change, recoverability and importance of the receptor or feature (Table 4-4). Characterisation of the receptor is achieved by balancing out these three considerations to determine the receptor's sensitivity:

- *Vulnerability* – The vulnerability of the receptor relates to its capacity to accommodate change i.e. the tolerance/intolerance of the receptor to change;
- *Recoverability* – The ability of the receptor to return to the baseline state before the Proposed Development's impact caused the change; and
- *Importance* – The importance of the receptor or feature is a measure of the value assigned to that receptor based on biodiversity and ecosystem services, social value and economic value. Importance of the receptor is also defined within a geographical context, whether it is important internationally, nationally or locally.

Table 4-4: Sensitivity Criteria

Sensitivity	Description
High	Receptor has little or no ability to absorb change without fundamentally altering its character. For example: a. Receptor has low/no capacity to return to baseline conditions within the Proposed Development's life, e.g. low tolerance to change and low recoverability such as a physical feature formed over a geological time scale, or loss of access with no alternatives.

Sensitivity	Description
	b. The receptor is a designated feature of a protected site or is rare or unique. c. Receptor is economically valuable.
Medium	Receptor has moderate capacity to absorb change without significantly altering its character, however some damage to the receptor will occur. For example: a. Receptor has intermediate tolerance to change. b. Medium capacity to return to baseline condition, e.g. >5 of up to 10 years. The receptor is valued but not protected.
Low	The receptor is tolerant to change without significant detriment to its character. Some minor damage to the receptor may occur. For example: a. Receptor has high tolerance to change. b. High capacity to return to baseline condition, e.g. within 1 year or up to 5 years. c. May affect socio-economic behaviour but is not a nuisance to users. The receptor is common and/or widespread.
Very Low	The receptor is tolerant to change with no effect on its character. The Proposed Development's activity does not have a detectable effect on survival or viability.

Evaluating the Significance of Effects

- 4.5.7 Having established the magnitude of change and the sensitivity of the receptor the significance of an effect can be assessed. The identification of significance typically requires the application of professional judgement; however a significance matrix (Table 4-5) may also be used as a guide to help identify the likely significance of effects.
- 4.5.8 The significance of effects will be evaluated with reference to available definitive standards, accepted criteria and legislation. For issues where definitive quality standards do not exist, significance will be based on the:
- Magnitude of the impact;
 - Effect duration, and whether effects are temporary, reversible or permanent;
 - Effect nature (whether direct or indirect, reversible or irreversible, beneficial or adverse);
 - Whether the effect occurs in isolation, is cumulative or interacts with other effects;
 - Performance against any relevant environmental quality standards;
 - Number of receptors affected; and
 - Sensitivity of the receptor.
- 4.5.9 Potential effects are identified with due consideration of any embedded mitigation measures being in place and then re-evaluated following the incorporation of any additional mitigation to identify the residual effects. Further information on mitigation measures is provided below.

- 4.5.10 Each of the specialist disciplines undertaking EIA may have a variation of the table below that aligns with magnitude and sensitivity criteria that best suits their topic area, which may also be defined in industry guidelines. These criteria and determination of significance are outlined in the specialist chapters (Chapters 5-19) below.

Table 4-5: Significance of Effect Matrix

Sensitivity of Receptor	Magnitude of Change				
		Very Low	Low	Medium	High
	High	Negligible/ Minor	Moderate	Major	Major
	Medium	Negligible	Minor	Moderate	Major
	Low	Negligible	Negligible	Minor	Moderate
	Very Low	Negligible	Negligible	Negligible	Negligible/Minor

- 4.5.11 The result of the interpretation of this matrix in line with the approach defined by each discipline is the assignment of the level of significance of the effect for all potential Proposed Development's related impacts.
- 4.5.12 Table 4-6 provides typical descriptions for each of the four significant effect definitions.

Table 4-6: Generic Significant Effect Descriptions

Sensitivity	Description	Significant Effect?
Major	A large and detrimental change to a sensitive receptor: likely or apparent exceeding of accepted (often legal) threshold. A large and beneficial change, leading to improvements to the baseline resulting in previously poor conditions being replaced by new legal compliance or major contribution being made to national targets. These effects may represent key factors in the decision-making process. Potentially associated with site and features of national importance or likely to be important considerations at a regional or district scale. Major effects may relate to resources or features which are unique and which, if lost, cannot be replaced or relocated.	Yes
Moderate	A medium scale change which, although not beyond an acceptable threshold, is still considered to be generally unacceptable, unless balanced out by other significant positive benefits of a project. Likely to be in breach of planning policy rather than a legal statute. These effects, if adverse, are likely to be important at a local scale and on their own could have a	Yes, typically – but subject to application of professional judgement

Sensitivity	Description	Significant Effect?
	material influence on decision making. A positive moderate effect is a medium scale change that is significant in that the baseline conditions are improved to the extent that guideline targets are contributed to.	
Minor	A small change that, whilst adverse, does not exceed legal or guideline standards. Unlikely to breach planning policy. A small positive change, but not one that is likely to be a key factor in the overall balance of issues. These effects may be raised as local issues and may be of relevance in the detailed design of a project but are unlikely to be critical in the decision-making process.	No
Negligible	A very small scape change that is so small and unimportant that it is considered acceptable to disregard. Effects which are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error, these effects are unlikely to influence decision making irrespective of other effects.	No

- 4.5.13 Moderate and Major levels of significance are usually considered to be significant in EIA terms, whilst Negligible or Minor impacts are not considered to be significant.
- 4.5.14 In subsequent chapters of this report the general criteria described above have, where appropriate, been made more specific for each environmental topic based on relevant standards or guidelines. Further explanation of the approach to assessing impacts, including detail on proportionate assessment and the specific criteria to be used for each topic is set out in later chapters, with any deviation from this standard approach noted.

4.6 Approach to Mitigation

- 4.6.1 A standard hierarchical approach to identifying mitigation requirements will be used:
- *Avoid or Prevent*: In the first instance, mitigation should seek to avoid or prevent the adverse effect at source, for example by routing the pipelines away from a sensitive receptor;
 - *Reduce*: If the effect is unavoidable, mitigation measures should be implemented which seek to reduce the significance of the effect, for example the use of a noise bund to reduce noise levels at nearby noise sensitive receptors; and
 - *Offset*: If the effect can neither be avoided nor reduced, mitigation should seek to offset the effect through the implementation of compensatory mitigation, for example offsite habitat creation to replace habitat losses.
- 4.6.2 Mitigation measures fall into two categories, as follows:

- *Embedded Mitigation*: Measures that have been integrated into the Proposed Development in order to avoid or reduce adverse environmental effects. Such measures may include refinement of the design of the Proposed Development through an iterative process which involves seeking to avoid or reduce potential environmental effects through appropriate routeing, siting and specifications; and
- *Additional Mitigation*: Additional measures which will be identified and proposed following initial assessment. These will be presented within each of the topic chapters. These will be identified to further avoid or reduce potentially adverse environmental effects where they cannot be in the design of the Proposed Development.

- 4.6.3 The DCO will contain a requirement for a CEMP (which is likely to be formed of multiple plans for different parts or stages of the Proposed Development) and CTMP. An Outline CEMP will be prepared and submitted with the DCO application. This will contain mitigation measures described within the ES. A Commitments Register will also be prepared, which will tabulate all the environmental mitigation proposed as part of the ES and include detailed descriptions of the actions required by the main contractor(s) during the construction and operators during operation.
- 4.6.4 The Outline CEMP(s) would then be further developed once the main contractor(s) is appointed, ahead of the commencement of the relevant construction works. The requirement within the DCO would ensure that those measures included in the Outline CEMP and Commitments Register are legally secured and have to be implemented pre / during / post construction.

4.7 Evaluate and Assess Residual Significance

- 4.7.1 Residual effects assessed as Moderate or Major after consideration of both embedded and additional project specific mitigation measures, will normally require additional analysis and engagement in order to discuss and possibly further mitigate or offset where possible. Where further mitigation is not reasonably practicable a residual effect may remain.

4.8 Transboundary Effects

- 4.8.1 It is not anticipated that the Proposed Development will have significant transboundary effects. A completed transboundary screening matrix dealing with the potential effects of the Proposed Development on other European Economic Area (EEA) States is presented in Appendix C.

4.9 Cumulative Effects

- 4.9.1 The approach to assessing cumulative effects is described in Chapter 19.

4.10 Competent Experts

- 4.10.1 Regulation 14(4) of the EIA Regulations (Ref 4-3) requires that an ES is prepared by “competent experts” and that the ES is accompanied by a competent expert statement outlining the relevant expertise or qualifications of such experts.
- 4.10.2 This Scoping Report has been prepared and coordinated by organisations who are members of the Institute of Sustainability & Environmental Professionals (ISEP) EIA Quality Mark Scheme. This is an independently reviewed voluntary standard, requiring organisations to commit to excellence in their EIA activities. All specialists have demonstratable expertise in their fields.

4.11 References

- Ref 4-1** Planning Inspectorate (2025). PINS Advice Note 7 Environmental Impact Assessment: process, preliminary environmental information and environmental statements.
- Ref 4-2** HM Government (2008). Planning Act 2008. Available at: <https://www.legislation.gov.uk/ukpga/2008/29/contents>
- Ref 4-3** HM Government (2017). The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017. Available at: <https://www.legislation.gov.uk/uksi/2017/572/contents>
- Ref 4-4** IEMA (2004) IEMA Guidelines.

5. Air Quality

5.1 Introduction

- 5.1.1 This chapter of the Scoping Report considers the potential for air quality effects on human and ecological receptors that may arise from the Proposed Development. The chapter sets out the Study Area, presents an initial baseline, provides an overview of the assessment methodology to be followed for the environmental assessment and identifies the potential effects.
- 5.1.2 This chapter should be read in conjunction with Chapter 6: Biodiversity, Chapter 8: Traffic and Movement and Chapter 15: Human Health.

5.2 Legislation, Policy and Guidance

- 5.2.1 The policy, legislation and guidance relevant to the air quality assessment have been reviewed and summarised in the tables below.

Table 5-1: Legislation Relating to the Air Quality Assessment

Legislation	
The Environment Act 1995 (Ref 5-1)	
The Air Quality Standards (England) Regulations 2010 (Statutory Instrument (SI) 2010/1001), as amended (Ref 5-3)	
The Non-Road Mobile Machinery (NRMM) (Type-Approval and Emission of Gaseous and Particulate Pollutants) Regulations 2018 (SI 2018/764) (Ref 5-4)	
The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023 (Ref 5-5).	

Table 5-2: National Policy and Guidance Relating to the Air Quality Assessment

National Policy and Guidance	
Overarching National Planning Policy Statement for Energy (EN-1) (Ref 5-6)	Paragraph 5.2.6 in Section 5.2 Air Quality and Emissions states: <i>“Where a project is likely to have adverse effects on air quality, an assessment of such impacts must be considered in the Environmental Statement.”</i> Paragraph 5.2.7 further states that the ES should describe: <i>“any significant air emissions, their mitigation and any residual effects distinguishing between the project stages and taking account of any significant emissions from any road traffic generated by the project;</i> <i>the predicted absolute emission levels of the proposed project, after mitigation methods have been applied;</i> <i>existing air quality levels and the relative change in air quality from existing levels; and any potential eutrophication impacts”.</i>
National Planning Policy Framework (NPPF) (Ref 5-7)	Paragraph 186 states: <i>“Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management</i>

National Policy and Guidance	
	<i>Areas (AQMA) and Clean Air Zones, and the cumulative impacts from individual sites in local areas. Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement. So far as possible these opportunities should be considered at the plan-making stage, to ensure a strategic approach and limit the need for issues to be reconsidered when determining individual applications. Planning decisions should ensure that any new development in AQMA and Clean Air Zones is consistent with the local air quality action plan. The assessment will carefully consider the potential impact of the Project and establish whether it might constitute an obstacle to the achievement of strategic objectives that are set out within the air quality action plans of administrative authorities to bring about improvements in air quality within their AQMA.</i>
Clean Air Strategy 2019 (Ref 5-8)	Defra's Clean Air Strategy outlines the Government's proposed ambitions relating to reducing air pollution in order to protect health and nature, whilst boosting the economy. The strategy sits alongside three other UK government strategies: the Industrial Strategy, the Clean Growth Strategy and the 25 Year Environment Plan. Amongst others, the Clean Air Strategy proposes to halve the number of people living in locations where concentrations of particulate matter are above the World Health Organisation (WHO) guideline limit of 10 µg/m³ by 2025 and work in close collaboration with industry to explore further opportunities for industrial emissions reductions by developing a series of sector roadmaps to set standards aimed at making UK industry world leaders in clean technology.

Table 5-3: Local Policy and Guidance Relating to the Air Quality Assessment

Local Policy and Guidance
Cheshire East Council Air Quality Strategy (2024) (Ref 5-9)
Cheshire East Council Low Emission Strategy (2018) (Ref 5-10)
Cheshire West and Chester Council Low Emission Strategy (2018) (Ref 5-11)
Cheshire West and Chester Council Local Plan (Part Two) Land Allocations and Detailed Policies (2019) (Ref 5-12)
Derbyshire Dales District Council Adopted Derbyshire Dales Local Plan (2017) (Ref 5-13)
East Staffordshire Borough Council Air Quality Strategy (2024) (Ref 5-14)
Staffordshire Moorlands District Council Local Plan (2020) (Ref 5-15)
Greater Manchester Clean Air Plan (2021) (Ref 5-17)
Wirral Council Air Quality Strategy (2024) (Ref 5-18)

Table 5-4: Standards and Guidance Relevant to the Air Quality Assessment

Relevant standards and guidance
Defra Local Air Quality Management (LAQM) Technical Guidance (TG.22) document (2022) (Ref 5-19)
British Standard (BS) document BS 6069 (Part Two) (Ref 5-20)
Institute of Air Quality Management (IAQM) Guidance on the Assessment of Dust from Demolition and Construction v2.2 (2024) (Ref 5-21)
Environmental Protection UK (EPUK) & IAQM Land-Use Planning and Development Control: Planning for Air Quality (2017) (Ref 5-22)
EA Air Emissions Risk Assessment guidance (2016) (Ref 5-23)
IAQM Guide to the Assessment of Air Quality Impacts on Designated Nature Conservation Sites v1.1 (2020) (Ref 5-24)
EA Guidance on Emerging Techniques for Post-combustion carbon dioxide (CO ₂) capture (2021) (Ref 5-25)
Air Quality Modelling and Assessment Unit (AQMAU) Recommendations for the Assessment and Regulation of Impacts to Air Quality from Amine-Based Post-Combustion Carbon Capture Plants Guidance (2021) (Ref 5-26)
AQMAU Guidance on Deposition Modelling for Amines (2023) (Ref 5-27)

Air Quality Standards

- 5.2.2 The Air Quality Standards Regulations 2010 (Ref 5-3) define the policy framework for 12 air pollutants known to have harmful effects on human health or the natural environment. The Secretary of State for the Department of Environment, Food and Rural Affairs (Defra) has the duty of ensuring compliance with the air quality limit values (pollutant concentrations not to be exceeded by a certain date).
- 5.2.3 Some pollutants have standards expressed as annual average concentrations due to the chronic way in which they affect health or the natural environment, i.e., effects occur after a prolonged period of exposure to elevated concentrations. Other pollutants have standards expressed as 24-hour, 1-hour or 15-minute average concentrations due to the acute way in which they affect health or the natural environment, i.e., after a relatively short period of exposure. Some pollutants have standards expressed in terms of both long and short-term concentrations. Air quality limit values and objectives are quality standards for clean air. Table 5-5 sets out the national air quality standards and the standards relevant to this assessment.

Table 5-5: National Air Quality Standards

Pollutant	Averaging Period	Limit Value / Standard
Nitrogen Dioxide (NO ₂)	Annual mean	40 µg/m ³
	1-hour mean	200 µg/m ³ Not to be exceeded more than 18 times a year (99.79th percentile)
Particulate Matter (PM ₁₀)	Annual mean	40 µg/m ³
	24-hour mean	50 µg/m ³ Not to be exceeded more than 35 times a year (90.41st percentile)
Fine Particulate Matter (PM _{2.5})	Annual mean	20 µg/m ³
		12 µg/m ³ to be achieved by 2028 [1],[2]
		10 µg/m ³ to be achieved by 2040 [1]
Sulphur Dioxide (SO ₂)	24-hour mean	125 µg/m ³ Not to be exceeded more than 3 times a year (99.2nd percentile)
	1-hour mean	350 µg/m ³ Not to be exceeded more than 24 times a year (99.7th percentile)
	15-minute mean	266 µg/m ³ Not to be exceeded more than 35 times a year (99.9th percentile)
Carbon monoxide (CO)	Maximum daily running 8-hour mean	10,000 µg/m ³
Volatile Organic Compounds (VOCs) (as Benzene (C ₆ H ₆))	Annual mean	5 µg/m ³
Lead (Pb)	Annual mean	0.5 µg/m ³
Note: [1] The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023 (Ref 5-5) updated in 2023, to state that the “the annual mean level of PM_{2.5} in ambient air must be equal to or less than 10 µg/m³ (“the target level”)” by 31st December 2040. The Environmental Improvement Plan (2023) (Ref 28) sets an interim target of 12 µg/m³, to be achieved by 31st January 2028. [2] For the purpose of this assessment, a limit value of 12 µg/m³ for PM_{2.5} has been used.		

- 5.2.4 Statutory and nationally agreed environmental standards exist only for a limited number of substances emitted to air. For industries that fall within the Environmental Permitting Regulations (England and Wales) 2016 (Ref 29) ('Part A (1) Processes'), the EA has derived and published benchmark values for several other substances commonly emitted by industry. These benchmark

values, representing levels in ambient air with no appreciable risk or minimal risk to human health, are known as Environmental Assessment Levels (EALs). Although EALs do not carry any statutory basis, they are a benchmark for assessing harm.

- 5.2.5 The EALs are listed in the EA guidance (Ref 5-23) 'Air emissions risk assessment for your environmental permit'. This includes an additional EAL for hourly concentrations of carbon monoxide (CO) and annual average and hourly EALs for other species for emissions released from the existing cement and lime plant operations.
- 5.2.6 Additionally, depending on the carbon capture process employed at the Capture Facilities, emissions of amines and their breakdown products could occur if amine-based technology is employed. Due to the relatively new nature of amine-based carbon capture technology, there are limited EALs available for such pollutant species. The EA are deriving EALs for amines that are commonly used for carbon capture, with six amine species now having published EALs available. The use of amine-based technology has not been confirmed at the Capture Facilities; therefore an appropriate assessment using the available amine EALs will be carried out.
- 5.2.7 It is also known that some amines can potentially degrade (thermally and chemically) and form nitrosamines and nitramines (collectively referred to as N-amines) both during the carbon capture process itself and in the environment following release. Therefore, the impacts of both directly released N-amines and the N-amines produced through atmospheric degradation of released amines will also be considered in the assessment.
- 5.2.8 Only two EALs have been derived for N-amines, and the EAL for N-nitrosodimethylamine (NDMA) is considered to represent one of the most toxic nitrosamines and therefore results in a conservative EAL for assessment. The EA recommend that this EAL should be used to compare the total N-amine concentration from amine-based Capture Facilities emissions, where individual species are not known, to ensure a worst case assessment, although it should be recognised that some of the degradation products will be less harmful, and therefore this is a very conservative assumption.
- 5.2.9 Other degradation products, such as ammonia, formaldehyde, aldehydes, amides and ketones may also result from amine-base Capture Facilities, depending on the amine solvent used, and appropriate EALs, where available will be applied. The EALs applicable for this assessment for the protection of human health are shown in Table 5-6.

Table 5-6: EALs Relevant to the Assessment

Pollutant	Averaging Period	Limit Value / Standard
Acetaldehyde	1-hour mean	9,200 µg/m ³
	Annual mean	370 µg/m ³
Amides [1]	Annual mean	0.05 µg/m ³
Ammonia (NH ₃)	1-hour mean	2,500 µg/m ³
	Annual mean	180 µg/m ³
Antimony (Sb)	Annual mean	5 µg/m ³
	1-hour mean	150 µg/m ³
Arsenic (As)	Annual mean	0.006 µg/m ³
Benzene (C ₆ H ₆)	24-hour mean	30 µg/m ³
Cadmium (Cd)	Annual mean	5 ng/m ³

Pollutant	Averaging Period	Limit Value / Standard
	24-hour mean	0.03 µg/m ³
Chromium, Chromium II and Chromium III compounds (as Cr)	Annual mean	500 µg/m ³
	24-hour mean	2 µg/m ³
Cobalt (Co)	Annual-mean	100 µg/m ³
Copper (Cu)	Annual-mean	1,000 µg/m ³
	24-hour mean	0.05 µg/m ³
Diethanolamine (DEA)	24-hour mean	3 µg/ m ³
Diethylamine (DiEA)	24-hour mean	33 µg/ m ³
	1-hour mean	330 µg/ m ³
Diethylaminoethanol (DEELA or DEEA)	24-hour mean	110 µg/ m ³
Formaldehyde	30-minute mean	100 µg/ m ³
	Annual mean	5 µg/ m ³
Hexavalent Chromium (Cr VI)	Annual mean	0.00025 µg/ m ³
Hydrogen chloride (HCl)	1-hour mean	750 µg/ m ³
Hydrogen Fluoride	Monthly mean	16 µg/ m ³
	1-hour mean	160 µg/ m ³
Ketones [2]	1-hour mean	89,500 µg/ m ³
	Annual mean	6,000 µg/ m ³
Manganese (Mn)	Annual mean	0.15 µg/ m ³
	1-hour mean	1,500 µg/ m ³
Mercury (Hg)	1-hour mean	20 µg/ m ³
	24-hour mean	0.06 µg/ m ³
	Annual mean	0.6 µg/ m ³
Monoethanolamine (MEA)	1-hour mean	100 µg/ m ³
	Annual mean	400 µg/ m ³
Morpholine (MOR)	Annual mean	40 µg/ m ³
Nickel (Ni)	24-hour mean	0.02 µg/ m ³
	Daily mean	0.7 µg/ m ³
N-nitrosodimethylamine (NDMA)	Annual mean	0.2 ng/ m ³

Pollutant	Averaging Period	Limit Value / Standard
N-nitrosomorpholine (NMOR)	1-hour mean	0.005 µg/ m ³
	Annual mean	0.037 µg/m ³
Piperazine (PZ)	1-hour mean	15 µg/m ³
Polychlorinated biphenyls (PCBs)	Annual mean	0.2 µg/m ³
	1-hour mean	6 µg/m ³
Tetrahydrofuran	Annual mean	3,000 µg/m ³
	Annual mean	59,900 µg/m ³
Thallium (Tl)	1-hour mean	100 µg/m ³
[1] EAL for Acrylamide used, as lowest EAL of any amide listed in the EA Risk Assessment Guidance (Ref 23), therefore used for a conservative assessment. [2] EAL for Methyl ethyl ketone used, as the lowest EAL of any ketone listed in the EA Risk Assessment Guidance (Ref 23), therefore used for a conservative assessment.		

5.3 Defining the Study Area

Consultation and Engagement

- 5.3.1 No engagement or consultation has so far been undertaken regarding air quality due to the early stage of the Project. As the Project progresses, engagement will be sought with the relevant parties as and when required in addition to the consultations.

Defining the study and survey areas

- 5.3.2 The Study Area is defined as the area within which air quality receptors may experience effects as a result of the Proposed Development during construction, operation and / or decommissioning. The approach to defining the spatial extent of the Study Area for air quality has been informed by the Institute of Air Quality Management (IAQM) (2017, 2020 and 2024) guidance documents (Ref 5-22, Ref 5-25 and Ref 5-21) and the EA's guidance (Ref 5-23) 'Air emissions risk assessment for your environmental permit'. These guidance documents will be used in the screening process to consider the requirement to undertake a detailed air quality modelling assessment and to inform the construction dust assessment.
- 5.3.3 The Study Area will comprise buffers measured from the Scoping Boundary as follows:
- A 2 km buffer for operational human health receptors; and
 - A 10 km buffer for internationally and nationally designated ecological receptors.

5.4 Baseline Environment

- 5.4.1 Baseline ambient air quality refers to the concentrations of relevant substances that are already present from various sources such as industrial processes, commercial and domestic activities, agriculture, traffic and natural sources.
- 5.4.2 For this Scoping Report, details on the existing ambient conditions through background monitoring data from both the local authorities and Defra have not been included. These will be included and assessed in the next stage of the assessment when the design is more progressed. To do this, a

desk-based review of the following data sources will be undertaken to determine air quality conditions around the Proposed Development:

- The Defra background pollutant concentration online database (Ref 5-35); and
- The Annual Status Reports (ASR) for the local authorities whereby the Proposed Development passes through.

5.4.3 This Scoping Report identifies the main sources of air pollution within 2 km of the Capture Facilities, and any human health sensitive receptors that may be impacted by the Capture Facilities.

5.4.4 It also identifies any ecologically sensitive receptors within 10 km of the Capture Facilities that may be impacted, along with those key sensitive receptors found along the pipeline routes. It should be noted that both the 2 km and 10 km Study Areas cross multiple local authorities, including:

- Derbyshire Dales District Council;
- East Staffordshire Borough Council;
- High Peak Borough Council;
- Staffordshire Moorlands District Council;
- Cheshire East Council;
- Cheshire West and Chester Council; and
- Wirral Council.

5.4.5 The following data sources have been used to gather information regarding the existing conditions:

- Air Quality Management Area (AQMA) boundaries provided by Defra's UK Air Information Resource (UK-Air) (Ref 30);
- Designated ecological sites provided by Natural England's MAGIC maps (Ref 5-31); and
- Industrial installations that hold an environmental permit provided by the EA (Ref 5-32).

5.4.6 Sensitive human receptors are defined as those residential properties/schools/hospitals that are likely to experience a change in pollutant concentrations and/or dust nuisance due to the construction and operation of the Proposed Development.

5.4.7 Furthermore, ecological receptors have been reviewed within the vicinity of the Proposed Development in accordance with EA guidance (Ref 5-34):

- Special Protection Areas (SPA), Special Areas of Conservation (SAC), Ramsar Sites and Sites of Special Scientific Interest (SSSI) within 10 km; and
- Local Nature Sites (including ancient woodlands (AW), Local Wildlife Sites (LWS), National Nature Reserves (NNR) and Local Nature Reserves (LNR) within 2 km.

5.4.8 The existing air quality concentrations at the identified ecological receptor sites, and the existing acid and nutrient nitrogen deposition rates at those sites, will be obtained from the UK Air Pollution Information System (APIS), supplemented by data from UK-AIR (Ref 5-33).

Breedon Capture Facility

Table 5-7: Air Quality Baseline Environment – Breedon Capture Facility

Air Quality Baseline environment – Breedon Capture Facility		
Baseline		
The Breedon Capture Facility is located along the border of two local authorities: Derbyshire Dales District Council (DDDC) and HPBC, within the Peak District National Park. HPBC has declared two AQMAs due to exceedances of the 40 µg/m³ annual mean objective for NO₂. DDDC has declared one AQMA due to exceedances of the 40 µg/m³ annual mean objective for NO₂. None of the three declared AQMAs are within 2 km of the facility boundary, making it unlikely that the Proposed Development will have any impact on them. Other than the Breedon Cement production plant, there are no further Part A (1) processes within 2 km of the Hope Cement carbon capture facility. Any contributions from releases to air from the existing facility would be included within the Defra background concentrations (to be assessed in the next stage of the assessment). There are sensitive human receptors including the villages of Castleton, Bradwell, Hope, Thornhill and Little Hucklow. Four schools are also within 2 km of the Scoping Boundary. There are no locally designated sites within 2 km of the Breedon Capture Facility; however there are two SACs, one SPA and 30 SSSIs within 10 km.		
Sensitive Receptors		
Receptor Type	Receptor Name	Approximate distance and direction from Breedon Capture Facilities
Human	Bradwell, residential	0.1 km south
Human	Hope Valley College	0.2 km north
Human	Hope, residential	0.1 km north
Human	Bradwell Junior School	0.3 km south-east
Human	Bradwell Church of England Infant School	0.6 km south
Human	Castleton, residential	0.7 km north-west
Human	Castleton Church of England Primary School	1 km north-west
Human	Thornhill, residential	1.7 km north-east
Human	Little Hucklow, residential	1.9 km south
Ecological	Dirtlow Rake and Pindale, SSSI	Within
Ecological	South Lee Meadows, SSSI	Within
Ecological	Castleton, SSSI	Within
Ecological	Oxlow Rake, SSSI	0.5 km, north-west
Ecological	Bradwell Dale and Bagshaw Cavern, SSSI	0.3km , east

Air Quality Baseline environment – Breedon Capture Facility		
Ecological	Hallam Barn Grasslands, SSSI	0.8 km north-east
Ecological	Bradwell Meadows, SSSI	1 km, south
Ecological	Portway Mine, SSSI	1.1 km west
Ecological	Tideslow Rake, SSSI	1.9 km south
Ecological	Lee Farm Meadow, Tideswell, SSSI	2 km south-west
Ecological	River Derwent at Hathersage, SSSI	2.6 km east
Ecological	Peak District Dales, SAC	2.9 km south-west
Ecological	Abney & Bretton Cloughs, SSSI	3.1 km south-east
Ecological	Monk's Dale, SSSI	3 km south-west
Ecological	Eastern Peak District Moors, SSSI	2.8 km north-east
Ecological	Lower Hollins, SSSI	3.3 km north-west
Ecological	Dark Peak, SSSI	2.8 km north-east
Ecological	South Pennine Moors, SAC	2.8 km north-west
Ecological	Peak District Moors, SPA	2,8 km north-east
Ecological	Waterfall Meadows, SSSI	4.7 km south-east
Ecological	Stoney Middleton Dale, SSSI	5.1 km, south-east
Ecological	Cressbrook Dale, SSSI	5.2 km, south
Ecological	Edale, SSSI	4,8 km north-west
Ecological	The Wye Valley, SSSI	5.2 km south
Ecological	Rowlee Bridge, SSSI	4.8 km north-west
Ecological	Duchy Quarry, SSSI	5.8 km, south-west
Ecological	Lower Peaslows Farm Meadow, SSSI	6.0 km, west
Ecological	Longstone Moor, SSSI	6.8 km, south-east
Ecological	Coombs Dale, SSSI	7.7 km, south-east
Ecological	Yarncliff Wood, Padley, SSSI	7.6 km, south-east
Ecological	Waterswallows Quarry, SSSI	7.8 km, south-west
Ecological	Calton Hill, SSSI	8.9 km, south
Ecological	Combs Reservoir, SSSI	9.9 km, west

Tarmac and Buxton Lime Capture Facilities

- 5.4.9 For the scoping baseline assessment, the Tarmac Capture Facility and the Buxton Lime Capture Facility are assessed as one site, due to their proximity to each other.

Table 5-8: Air Quality Baseline Environment – Tarmac and Buxton Lime Capture Facilities

Air Quality Baseline environment – Tarmac and Buxton Lime Capture Facilities		
Baseline		
The Tarmac and Buxton Lime Capture Facilities will be located within the boundary of the High Peak Borough Council (HPBC). HPBC has declared two Air Quality Management Areas (AQMAs) due to exceedances of the annual mean objective for NO₂ (40 µg/m³). However, neither AQMA lies within 2 km of the Tarmac & Buxton Lime Capture Facilities, making it unlikely that the Proposed Development will have any impact on them. Other than the Tarmac Cement production plant and Buxton Lime production plant there are no further Part A (1) process with releases to air within 2 km of the sites identified on the EA website. Any contributions from releases to air from the existing facilities would be included within the Defra background concentrations (to be assessed in the next stage of the assessment). There are sensitive human receptors within 2 km of the Tarmac Capture Facility and the Buxton Lime Capture Facility, including the village of Upper End, the east side of the town of Buxton, the village of King Sterndale, the neighbourhood of Cowdale, the village of Smalldale and residential properties off Batham Gate Road. There are numerous ecological receptors within 10 km of the Tarmac Capture Facility and the Buxton Lime Capture Facilities, including two SACs, one SPA and 36 SSSIs. In addition, there are six plots of Ancient Woodland (AW) within 2 km.		
Sensitive Receptors		
Receptor Type	Receptor Name	Approximate distance and direction from Tarmac Capture and the Buxton Lime Capture Facilities
Human	Upper End, Residential	200 m, north
Human	Batham Gate Road, Residential	500 m, north-west
Human	King Sterndale, Residential	1.3 km, south
Human	Cowdale, Residential	1.8 km, south-west
Human	Buxton, Residential	1.8 km, west
Ecological	The Wye Valley, SSSI	200 m, south-west
Ecological	Peak District Dales, SAC	200 m, south
Ecological	Waterswallows Quarry, SSSI	300 m, south
Ecological	Duchy Quarry, SSSI	900 m, north
Ecological	Unnamed Plot 1, AW	1 km, south
Ecological	Topley Pike Wood, AW	1.1 km south-east
Ecological	Topley Pike and Deep Dale, SSSI	1.1 km, south
Ecological	Pigtor Wood, AW	1.1 km, south

Air Quality Baseline environment – Tarmac and Buxton Lime Capture Facilities

Human	Smalldale	1.4 km, north
Ecological	Unnamed Plot 2, AW	1.5 km, east
Ecological	Flag and Chee Dale Wood, AW	1.8 km, east
Ecological	Ashwood Dale South, AW	1.8 km, south-west
Ecological	Monk's Dale, SSSI	2.3 km, north-east
Ecological	Calton Hill, SSSI	2.5 km, south-east
Ecological	Poole's Cavern and Grin Low Wood, SSSI	3.8 km, south-west
Ecological	Lee Farm Meadow, Tideswell, SSSI	4.3 km, north-east
Ecological	South Pennine Moors, SAC	4.4 km, west
Ecological	Peak District Moors, SPA	4.4 km, west
Ecological	Lower Peaslows Farm Meadow, SSSI	4.8 km, north
Ecological	Goyt Valley, SSSI	4.4 km, west
Ecological	Castleton, SSSI	5.0 km, north
Ecological	Combs Reservoir, SSSI	5.2 km, north-west
Ecological	Oxlow Rake, SSSI	5.4 km, north-east
Ecological	Tideslow Rake, SSSI	5.5 km, north-east
Ecological	Leek Moors, SSSI	5.9 km, south-west
Ecological	Portway Mine, SSSI	6.1 km, north-east
Ecological	Chrome and Parkhouse Hills, SSSI	6.4 km, south-west
Ecological	Cressbrook Dale, SSSI	6.5 km, east
Ecological	Upper Lathkill, SSSI	6.7 km, south-east
Ecological	Hurdlow Meadows, SSSI	7.0 km, south
Ecological	Dark Peak, SSSI	7.0 km, north
Ecological	Foxhole Cave, SSSI	7.4 km, south
Ecological	Colshaw Pastures, SSSI	7.4 km, south-west
Ecological	Moss Carr, SSSI	7.7 km, south
Ecological	Bagwell Dale and Bagshaw Cavern, SSSI	8.0 km, north-east
Ecological	Longstone Moor, SSSI	8.4 km, east
Ecological	Dirtlow Rake and Pindale, SSSI	8.2 km, north-east
Ecological	Abney & Bretton Cloughs, SSSI	8.9 km, east
Ecological	Lathkill Dale, SSSI	9 km, south-east
Ecological	Toddbrook Reservoir, SSSI	9.0 km, north-west
Ecological	Waterfall Meadows, SSSI	9.7 km, east
Ecological	Edale, SSSI	9.0 km, north
Ecological	Bradwell Meadows, SSSI	9.4 km, north-east
Ecological	South Lee Meadows, SSSI	9.7 km, north-east

Air Quality Baseline environment – Tarmac and Buxton Lime Capture Facilities

Ecological	Stoney Middleton Dale, SSSI	9.9 km, east
Ecological	Lower Hollins, SSSI	10 km, north

Holcim Cement Capture Facility

Table 5-9: Air Quality Baseline Environment Holcim Capture Facility

Air Quality Baseline environment – Holcim Capture Facilities

Baseline

The Holcim Capture Facility is located within the boundary of the Staffordshire Moorlands District Council (SMDC).

SMDC have declared two AQMAs due to exceedances of the 40 µg/m³ annual mean objective for NO₂. However, neither AQMA lies within 2 km of the Holcim Cement carbon capture facility, making it unlikely that the Project will have any impact on them.

Other than the Holcim Cement production plant, there are no further Part A (1) processes within 2 km of the Cauldon Cement carbon capture facility. Any contributions from releases to air from the existing facility would be included within the Defra background concentrations (to be assessed in the next stage of the assessment).

There are sensitive human receptors within 2 km of the Holcim Capture Facility, including the villages of Cauldon, Cauldon Low, Waterhouses, Calton, residential receptors located on Stoney Lane, and Waterhouses Church of England Primary Academy & Nursery.

There is one Local Nature Reserve (LNR) within 2 km of the Holcim Capture Facility, and two SACs, one SPA and 18 SSSIs within 10 km.

Sensitive Receptors

Receptor Type	Receptor Name	Approximate distance and direction from Holcim Capture Facilities
Human	Cauldon, Residential	20 m, north
Human	Waterhouses, Residential	800 m, north
Human	Waterhouses Church of England Primacy Academy & Nursery	1 km, north
Human	Stoney Lane	1.1 km, south-west
Human	Cauldon Low	1.3 km, south-west
Human	Calton	1.5 km, north-east
Ecological	Caldon Dales, SSSI	Within the facility boundary
Ecological	Cauldon Railway Cutting, SSSI	200 m, north-west
Ecological	Cauldon Low, SSSI	30 m, east
Ecological	Brownend Quarry, SSSI	370 m, north-east

Air Quality Baseline environment – Holcim Capture Facilities		
Ecological	Hamps and Manifold Valleys, SSSI	500 m, east
Ecological	Rue Hill, SSSI	700 m, south
Ecological	Hoften's Croft Meadows, LNR	1.1 km, south
Ecological	Peak District Dales, SAC	1.5 km, north-east
Ecological	Swineholes Wood and Black Heath, SSSI	1.7 km, west
Ecological	Stanton Pastures & Cuckoocliff Valley, SSSI	2.6 km, south-east
Ecological	Bath Pasture, SSSI	3.2 km, south
Ecological	Churnet Valley, SSSI	3.1 km, west
Ecological	Whiston Eaves, SSSI	4.5 km, south-west
Ecological	Dove Valley and Biggin Dale, SSSI	5.5 km, east
Ecological	Froghall Meadow and Pastures, SSSI	5.1 km, south-west
Ecological	Dimmings Dale & The Ranger, SSSI	6.0 km, south
Ecological	Combes Valley, SSSI	6.7 km, north-west
Ecological	Saltersford Lane Meadows, SSSI	7 km, south
Ecological	Ecton Copper Mines, SSSI	7.5 km, north
Ecological	South Pennine Moors, SAC	9.2 km, north
Ecological	Peak District Moors, SPA	9.2 km, north
Ecological	Leek Moors, SSSI	9.2 km, north

Peak Cluster Pipeline – East, West and Central (including AGI's)

- 5.4.10 The Peak Cluster Pipeline is proposed to run through both rural and urban landscapes, passing adjacent to designated ecological sites such as Peak District (SAC), Dee Estuary (SAC, SPA and Ramsar), South Pennine Moors (SAC), and Sandbach Flashes (SSSI). With respect to human health receptors, the pipeline will pass by the towns of Macclesfield, Chapel-en-le-Frith, Leek, Middlewich, Ellesmere Port, the city of Chester and settlements on the Wirral Peninsula.
- 5.4.11 A complete baseline assessment of the existing conditions along the length of the pipeline corridor will be undertaken and reported in the ES.

Coastal AGI to MLWS Pipeline(s)

- 5.4.12 The Coastal AGI to MLWS Pipeline(s) is proposed to be situated at the end of the route near landfall, with nearby ecological receptors including Mersey Narrows & North Wirral Foreshore (Ramsar), Dee Estuary (SAC), and Liverpool Bay (SPA). With respect to human health receptors, the pipeline is nearby to the settlements of Meols, Greasby, and Moreton.
- 5.4.13 A complete baseline assessment of the existing conditions of the Coastal AGI to MLWS Pipeline(s) will be undertaken and reported in the ES.

Future Baseline

- 5.4.14 The future baseline will be presented and will consider natural changes from the existing baseline scenario without implementation of the Proposed Development.

- 5.4.15 Concentrations of NO_x, NO₂, PM₁₀ and PM_{2.5} are likely to continue to decrease in future years as a result of vehicle turnover and fleet renewal, improvements in technology and the introduction of more stringent regulations and policies.
- 5.4.16 It is likely that over time, with greater regulation, emissions to air will decrease; however, for the purposes of this assessment, it is assumed that there will be no material changes to the existing baseline ambient conditions to ensure a conservative assessment is carried out.

5.5 Identification of Potential Effects

- 5.5.1 Construction of the Proposed Development has the potential to affect local air quality through fugitive dust emissions from construction activities and emissions generated by plant equipment. In addition, changes in traffic patterns on the local road network during the construction phase may contribute to further air quality impacts.
- 5.5.2 During operation, emissions from the carbon capture facilities could influence local air quality by altering the location of release points, the dispersion of existing pollutants or adding additional pollutant species (e.g., amines and their breakdown products as a result of the carbon capture process chosen) to the operational emissions.

5.6 Scope and Methodology

- 5.6.1 This section outlines the scope and methodology that will be employed for assessing the likely significant effects associated with air quality.

Scope

- 5.6.2 The assessment will consider potential impacts on identified human health and ecologically sensitive receptors as a result of:
- Construction dust impacts from any construction, demolition and trackout activities (which is the transfer of dust and dirt onto public roads by vehicles leaving the site);
 - Construction traffic impacts due to the traffic changes on the local road network;
 - Emissions to air from the operational phase of the Proposed Development, considering the normal operation of the carbon capture facilities and including appraisal of effects of the change in the release parameters, and/ or the additional releases of amines and amine degradation products, depending on the capture technology applied;
 - Emissions to air from on-site power generation if required; and
 - Operational traffic impact.

Methodology

- 5.6.3 The overall approach to the air quality assessment will comprise:
- A review of the existing air quality conditions at, and in the vicinity of, the Proposed Development;
 - An assessment of the potential changes in air quality arising from the construction, operation and maintenance of the Proposed Development;
 - Comparison of the changes with the defined significance criteria to determine the level of impact; and

- Formulation of mitigation measures, where appropriate, to ensure any adverse effects on air quality are minimised.

Methodology of Construction Assessment

Construction Dust

- 5.6.4 The construction and decommissioning phases of the Proposed Development will be assessed using the qualitative approach outlined in the latest IAQM guidance (Ref 5-21).
- 5.6.5 The following Study Areas, as detailed in the IAQM Guidance (Ref 5-21) will be used where an assessment of dust emissions produced by construction activities is required:
- A human receptor within:
 - 250 m of the limits of construction activity; or
 - 250 m of site access points (in relation to trackout); and
 - Vehicles on the public highway, up to 50 m from the site entrance(s).
 - An ecological receptor within:
 - 50 m of the limits of construction activity within the site considered; or
 - 50 m of the route(s) used by construction vehicles; and
 - On the public highway, up to 250 m from the site entrance(s).
- 5.6.6 An impact refers to a change in pollutant concentrations or dust deposition, while an effect is the consequence of that impact. Potential construction-phase impacts include:
- Dust deposition causing surface soiling;
 - Visible dust plumes; and
 - Elevated PM₁₀ from on-site dust generating activities.
- 5.6.7 IAQM guidance evaluate dust emissions from activities such as demolition, earthworks, building construction and trackout. For each activity, three effects are considered:
- Annoyance from dust soiling;
 - Harm to receptors; and
 - Health risks from increased PM₁₀ exposure.
- 5.6.8 Receptors (human or ecological) are identified based on sensitivity to dust soiling and PM₁₀. Sensitive receptors include residential properties, schools, and hospitals likely to experience pollutant changes or dust nuisance.
- 5.6.9 The methodology accounts for activity scale (small, medium, or large), background PM₁₀ levels, and receptor proximity to determine area sensitivity and overall site risk. Appropriate mitigation measures will be proposed to reduce air quality impacts during construction.
- 5.6.10 Full methodology details will follow in the next assessment stage.

Construction Traffic

- 5.6.11 Potential impacts on air quality during the construction phase of the Proposed Development could arise due to the traffic changes on the local road network.

5.6.12 The EPUK/IAQM land-use guidance (Ref 5-22) will determine if a detailed assessment of construction traffic is required. As the Proposed Development is more than 2 km from the nearest AQMA, and the AQMA was declared for exceedances in SO₂, the Proposed Development is unlikely to impact it. Therefore, the screening criteria are as follows:

- A change of Light Duty Vehicle (LDV) flow of more than 500 Annual Average Daily Traffic (AADT) movements; or
- A change of Heavy Duty Vehicle (HDV) flows of more than 100 AADT movements.

5.6.13 If either threshold is exceeded, detailed dispersion modelling will assess the potential effects and their significance.

Methodology of Operational Assessment

Operational Plant

5.6.14 Due to the nature of the activities and technologies used for carbon capture facilities, operational impacts on air quality from the capture facilities will be assessed through detailed dispersion modelling using the advanced dispersion model ADMS.

Operational Traffic

5.6.15 Potential impacts on air quality during the operational phase of the Proposed Development could arise due to traffic changes on the local road network, however it is anticipated that operational traffic numbers will be considerably less than construction traffic. The screening criteria outlined above in paragraph 5.6.12, are also applicable for operational traffic and will be used for the assessment of operational traffic, however it is envisaged that this will be able to be scoped out from requiring detailed assessment.

Methodology of Decommissioning Assessment

5.6.16 At the time of writing, it is anticipated that relevant above ground structure(s) will be removed, but the pipeline will be made safe and then will remain in-situ. Therefore, it is expected that the impacts of decommissioning will be less than that of the construction phase.

5.6.17 However, the potential impacts on air quality from the decommissioning of the Proposed Development will not be evaluated in this air quality impact assessment. A further assessment of any decommissioning-related impacts on air quality will be conducted at the time of decommissioning, adhering to the relevant guidance and regulations in place at the time.

Consultation

5.6.18 Consultation for the Proposed Development will be undertaken with statutory parties, including the EA and the relevant Local Planning Authorities. The need for air quality-specific consultation and engagement as part of the overall consultation for the Proposed Development will be reviewed on an ongoing basis.

Assumptions and limitations

5.6.19 This chapter includes a high-level review of some available data and presents an overview of the receptors, AQMAs and industrial emissions present around the proposed capture facility sites, with existing baseline ambient conditions to be presented in the next stage of the assessment. Given the scale of the Proposed Development, this chapter is only intended to identify potential pathways to significant effects for the purpose of defining a scope for the air quality assessment as part of the ES.

- 5.6.20 As previously stated, baseline assessments for the Peak Cluster Pipeline and Coastal AGI to MLWS Pipeline(s) have not been conducted in this chapter. Information for these will be gathered and incorporated into the assessment, presented within the ES.

Summary of issues to be scoped in / out

- 5.6.21 Table 5-10, Table 5-11 and Table 5-12 below outline a summary of issues proposed to be scoped in or out at the assessment phase.

Table 5-10: Air Quality Scope – Capture Facilities

Air Quality Scope – Capture Facilities				
Scope Scoped in ✓, scoped out ✗	Construction (C), Operation (O), Decommissioning (D)			Rationale
	C	O	D	
Dust Emissions	✓	n/a	✗	The construction of the Capture Facilities may impact on air quality in the local area due to potential fugitive emissions of dust from construction works, and emissions from plant equipment. In addition, the screening criteria as per the IAQM guidance for a construction dust assessment is 250 m from the site boundary for human health receptors and 50 m for ecological receptors. There are some highly sensitive human receptors within the assessment areas, and low sensitivity ecological receptors adjacent to or within the site boundaries. Therefore, following the IAQM guidance screening criteria, a construction dust assessment will be scoped in. Dust-related impacts as a result of decommissioning will be assessed at the time of decommissioning; therefore, a demolition dust assessment has been scoped out. It is considered that there would be no change to any operational activities that may generate dust, and so will not be considered further in this assessment.
Vehicle Movements	✓	✗	✗	Air quality impacts from the Proposed Development could arise due to traffic changes on the local road network during the construction phase and the demolition phase. Although detailed construction information is not yet available, it is expected to result in changes to the use of the local road network. As exact figures are unknown, construction and demolition vehicle movements will be scoped in. A small increase in workforce numbers is anticipated during the operational phase; however, the resulting variation in vehicle movements on the local road network is expected to have minimal impact. Using the workforce information provided in Chapter 3: The Proposed Development, a worst-case scenario was assumed: 56 staff each at Breedon, Tarmac and Buxton Lime, plus 28 staff at Holcim, all commuting individually by car over 280 working days per year. This results in 356 daily trips across all sites, equating to AADT movements of approximately 203 LDV movements, which is

Air Quality Scope – Capture Facilities				
				well below the 500 LDV screening threshold. Therefore, operational vehicle movements will be scoped out.
Operational Emissions	n/a	✓	n/a	The Capture Facilities will change the way in which existing pollutants are dispersed from the operational facilities and therefore the impacts associated with the change in dispersion will be assessed through detailed dispersion modelling. Depending on the capture technology and power solution employed at each Capture Facility there may also be additional pollutants released that will need assessment. This could include amines and amine degradation product if amine-based carbon capture technology is used.

Table 5-11: Air Quality Scope – Peak Cluster Pipeline

Air Quality Scope – Peak Cluster Pipeline				
Scope Scoped in ✓, scoped out ✗	Construction (C), Operation (O), Decommissioning (D)			Rationale
	C	O	D	
Dust Emissions	✓	✗	✗	The construction of the Peak Cluster Pipeline may impact on air quality in the local area due to potential fugitive emissions of dust from construction works, and emissions from plant equipment. A baseline assessment of ambient conditions for the pipeline has not yet been undertaken; however, due to the length of the pipeline, it is anticipated that there will be sensitive human and ecological receptors within proximity to the construction site. Therefore, dust emissions for construction have been scoped in. Dust-related impacts as a result of decommissioning will be assessed at the time of decommissioning; therefore, a demolition dust assessment has been scoped out. No operational activities are anticipated to generate dust. Repairs and maintenance works are anticipated; however, these will only be in response to an identified issues and not routine. Therefore, operational dust emissions can be scoped out.

Air Quality Scope – Peak Cluster Pipeline				
Vehicle Movements	✓	✗	✗	Air quality impacts from the Proposed Development could arise due to traffic changes on the local road network during the construction phase and the demolition phase. Although detailed construction information is not yet available, it is expected to result in changes to the use of the local road network. As exact figures are unknown, construction vehicle movements will be scoped in. Due to the nature of the pipeline, operational traffic effects are expected to be negligible and only appear when repairs are to be made. Therefore, operational traffic will be scoped out of the assessment. Impacts as a result of vehicle movements for decommissioning will be assessed at the time of decommissioning; therefore, a demolition vehicle movement assessment has been scoped out.
Operational Emissions	n/a	✗	n/a	Due to the nature of the pipeline, no operational emissions are anticipated. Therefore, operational phase emissions have been scoped out.

Table 5-12: Air Quality Scope – Coastal AGI to MLWS Pipeline(s)

Air Quality Scope – Coastal AGI to MLWS Pipeline				
Scope Scoped in ✓, scoped out ✗	Construction (C), Operation (O), Decommissioning (D)			Rationale
	C	O	D	
Dust Emissions	✓	n/a	✗	The construction of the Coastal AGI to MLWS Pipeline(s) may impact on air quality in the local area due to potential fugitive emissions of dust from construction works, and emissions from plant and equipment. A baseline assessment of ambient conditions for the pipeline has not yet been undertaken; however, due to the positioning of the pipeline, it is anticipated that there will be sensitive human and ecological receptors within proximity to the construction site. Therefore, dust emissions for construction have been scoped in.

Air Quality Scope – Coastal AGI to MLWS Pipeline				
				Dust-related impacts as a result of decommissioning will be assessed at the time of decommissioning; therefore, a demolition dust assessment has been scoped out. No operational activities are anticipated to generate dust; and so will not be considered further in this assessment.
Vehicle Movements	✓	✗	✗	Air quality impacts from the Proposed Development could arise due to traffic changes on the local road network during the construction phase and the demolition phase. Although detailed construction information is not yet available, it is expected to result in changes to the use of the local road network. As exact figures are unknown, construction vehicle movements will be scoped in. Due to the nature of the pipeline, operational traffic effects are expected to be negligible and only appear when repairs are to be made. Therefore, operational traffic will be scoped out of the assessment. Impacts as a result of vehicle movements for decommissioning will be assessed at the time of decommissioning; therefore, a demolition vehicle movement assessment has been scoped out.
Operational Emissions	n/a	✗	n/a	Due to the nature of the pipeline and the Coastal AGI , no operational emissions are anticipated. Therefore, operational phase emissions have been scoped out.

5.7 Planned Surveys

- 5.7.1 No surveys are anticipated to be required for the completion of the air quality assessment, as it is considered that there will be adequate data available from local authority monitoring or Defra background mapping. Existing data will also be used from the operators of each Capture Facility.

5.8 Mitigation

- 5.8.1 Example mitigation for the above-mentioned potential effects are presented below:

Construction

- Construction of the Proposed Development will be undertaken in line with both a CEMP and CTMP, which will include mitigation measures for the control of dust and the avoidance of likely significant effects.

Operation

- The individual Capture Facilities will operate in accordance with environmental permits issued by the EA. As part of this permitting process, a Best Available Techniques (BAT) assessment will be conducted on the proposed carbon capture technology.
- The EA set Emission Limit Values (ELVs) within the environmental permit for pollutant releases based on the relevant guidance, or levels that can be demonstrated to not result in potential for human health or ecological impacts. For carbon capture, the EA guidance will be considered within the individual Capture Facilities design and during the permitting process.

Decommissioning

- Decommissioning of the Proposed Development will be undertaken in line with a Decommissioning Environmental Management Plan (DEMP), which will include requirements to adhere to the relevant guidance and regulations in place at that time.

- 5.8.2 The ES will present a comprehensive list of all mitigation required to help avoid or reduce any adverse impacts.

5.9 Summary

- 5.9.1 The air quality assessment will address construction dust and emissions, operational emissions from the Capture Facilities, and vehicle emissions during construction, using a combination of qualitative and quantitative methods, including dispersion modelling where appropriate. If required, emissions associated with various AGI's (including the Coastal AGI) would also be included.
- 5.9.2 In the next stage of the assessment, a full, detailed baseline assessment for the entire Proposed Development will be undertaken, and screening criteria will be used to determine whether detailed traffic assessments are required. Detailed dispersion modelling will be undertaken for the operational emissions of the capture facilities.
- 5.9.3 Mitigation measures will be developed and informed by the detailed baseline and assessment stages and will seek to minimise potential adverse effects. This will focus on design and management measures to avoid or reduce adverse effects.

5.10 References

- Ref 5-1** UK Government (1995). Environment Act 1995, Chapter 25, Part IV Air Quality.
- Ref 5-2.** UK Government (2021). Environment Act 2021.
- Ref 5-3.** UK Government (2020). The Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020.
- Ref 5-4.** UK Government (2018). The Non-Road Mobile Machinery (Type-Approval and Emission of Gaseous and Particulate Pollutants) Regulations 2018.
- Ref 5-5.** UK Government (2023). The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023.
- Ref 5-6.** Department for Energy Security & Net Zero (2025). Overarching National Policy Statement for Energy (EN-1). Available at:
<https://assets.publishing.service.gov.uk/media/65bbfdbc709fe1000f637052/overarching-nps-for-energy-en1.pdf>
- Ref 5-7.** Ministry of Housing, Communities & Local Government (2024). National Planning Policy Framework. Available at:
https://assets.publishing.service.gov.uk/media/67aafe8f3b41f783cca46251/NPPF_December_2024.pdf
- Ref 5-8.** Defra (2019). Clean Air Strategy 2019. Available at:
<https://assets.publishing.service.gov.uk/media/5c3b9debe5274a70c19d905c/clean-air-strategy-2019.pdf>
- Ref 5-9.** Cheshire East Council (2024). Air Quality Strategy. Available at:
<https://www.cheshireeast.gov.uk/pdf/council-and-democracy/consultations/air-quality-strategy/final-draft-air-quality-strategy-2024-2029.pdf>
- Ref 5-10.** Cheshire East Council (2018). Low Emission Strategy. Available at:
https://moderngov.cheshireeast.gov.uk/ecminutes/documents/s65739/Cheshire%20East%20Low%20Emission%20Strategy_Final%2030-8-18.pdf
- Ref 5-11.** Cheshire West and Chester Council (2018). Low Emission Strategy. Available at:
<https://www.cheshirewestandchester.gov.uk/documents/pests-pollution-food-safety/pollution-and-air-quality/low-emission-strategy-180219.pdf>
- Ref 5-12.** Cheshire West and Chester Council (2019). Local Plan (Part Two) Land Allocations and Detailed Policies. Available at:
<https://consult.cheshirewestandchester.gov.uk/kse/event/34617/section/5428432>
- Ref 5-13.** Derbyshire Dales District Council (2017). Adopted Derbyshire Dales Local Plan. Available at: <https://www.derbyshiredales.gov.uk/planning/planning-policy-and-local-plan/local-plan/local-plan-information-and-adoption>
- Ref 5-14.** East Staffordshire Borough Council (2024). Air Quality Strategy. Available at:
<https://www.eaststaffsbc.gov.uk/sites/default/files/docs/pollution/Air%20Quality%20Strategy%202024-2029%20FINAL.pdf>

- Ref 5-15.** Staffordshire Moorlands District Council (2020). Local Plan. Available at: <https://www.staffsmoorlands.gov.uk/media/6155/Adopted-Local-Plan/pdf/c0Adopted Local Plan.pdf?m=1601645140880>
- Ref 5-17.** Greater Manchester Combined Authority (2021). GM Clean Air Final Plan. Available at: <https://democracy.greatermanchester-ca.gov.uk/documents/s15281/GMCA%20210621%20Report%20Clean%20Air%20Plan%20-%20FINAL%20FINAL.pdf>
- Ref 5-18.** Wirral Council (2024). Wirral's Air Quality Strategy 2024 to 2028. Available at: <https://www.wirral.gov.uk/environmental-problems/pollution-control/wirral-air-quality-strategy-2024-2028>
- Ref 5-19.** Defra (2025). Local Air Quality Management (LAQM) Technical Guidance document, TG.22. Available at: <https://laqm.defra.gov.uk/wp-content/uploads/2021/03/LAQM-TG22-May-25-v2.1.pdf>
- Ref 5-20.** BS 6069-2:1994, ISO 4225:1994 Characterisation of air quality.
- Ref 5-21.** IAQM (2024). Guidance on the Assessment of Dust from Demolition and Construction v2.2. Available at: <https://safe.menlosecurity.com/doc/docview/viewer/docN19DC4AED5A362f9511193937a91a7105370260e95078a885067a0013f03e90ba38b6f91fe267>
- Ref 5-22.** EPUK & IAQM (2017). Land-use Planning and Development Control: Planning for Air Quality. Available at: <https://safe.menlosecurity.com/doc/docview/viewer/docN19DC4AED5A36dda9a928961b28c133e280f7742d662c4eb9b2414b9cb0fe2ebee9e5fd331752>
- Ref 5-23.** Environment Agency (2016). Air emissions risk assessment for your environmental permit. Available at: <https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit>
- Ref 5-24.** IAQM (2020). Guide to the Assessment of Air Quality Impacts on Designated Nature Conservation Sites v1.1. Available at: <https://safe.menlosecurity.com/doc/docview/viewer/docN19DC4AED5A36d4deecc5b8978be08cf4a826d9a58bab910b8c901b5e977a4a9ca973fd48a856>
- Ref 5-25.** Environment Agency (2021). Post-combustion carbon dioxide capture: emerging techniques. Available at: <https://www.gov.uk/guidance/post-combustion-carbon-dioxide-capture-best-available-techniques-bat>
- Ref 5-26.** AQMAU (2021). Recommendations for the Assessment and Regulation of Impacts to Air Quality from Amine-Based Post Combustion Carbon Capture Plants Guidance. Available at: <https://ukccsrc.ac.uk/wp-content/uploads/2021/11/AQMAU-C2025-RP01.pdf>
- Ref 5-27.** AQMAU (2023). Guidance on Deposition Modelling for Amines. Available at: <https://nsip-documents.planninginspectorate.gov.uk/published-documents/EN010103-002888-Appendix%201%20-%20Main%20Letter%20-%20AQMAU%20Assessment%20Methodology.pdf>
- Ref 5-28.** Defra (2023). Environmental Improvement Plan 2023. Available at: <https://www.gov.uk/government/publications/environmental-improvement-plan>

- Ref 5-29.** UK Government (2016). Environmental Permitting (England and Wales) Regulations 2016.
- Ref 5-30.** Defra (2022). Air Quality Management Areas. Available at: <https://uk-air.defra.gov.uk/aqma/>
- Ref 5-31.** Defra. Multi-Agency Geographic Information for the Countryside (MAGIC). Available at: <https://magic.defra.gov.uk/>
- Ref 5-32.** Environment Agency. Environmental Permitting Regulations – Installations. Available at: <https://environment.data.gov.uk/public-register/view/search-industrial-installations>
- Ref 5-33.** Defra. UK-AIR. Available at: <https://uk-air.defra.gov.uk/>
- Ref 5-34.** Environment Agency (2019). Specified generators: dispersion modelling assessment. Available at: <https://www.gov.uk/guidance/specified-generators-dispersion-modelling-assessment>
- Ref 5-35.** Defra. Background Pollutant Mapping. Available at: <http://laqm.defra.gov.uk/review-and-assessment/tools/background-maps.html>

6. Biodiversity

6.1 Introduction

- 6.1.1 This chapter of the Scoping Report presents an initial baseline for ecology and biodiversity relevant to the Proposed Development. It identifies the need for additional surveys to ensure there is appropriate information to accurately characterise the baseline and sets out the Study Area. In addition, the chapter provides an overview of the proposed assessment methodology for the environmental assessment and identifies the potential effects provisionally identified.
- 6.1.2 This chapter does not address marine biodiversity which is included within Chapter 12: Marine Environment.
- 6.1.3 The objectives of the Ecological Impact Assessment (EclA) will be to:
- Identify and describe existing ecological features (and determine their importance) within and around the locale of the Proposed Development in a defined area (the Zone of Influence (Zol));
 - To assess the significance of the impacts of the Proposed Development and associated infrastructure on important ecological features following the implementation of agreed mitigation measures; and
 - Where required, identify appropriate compensation measures where significant effects upon important ecological features cannot be avoided or mitigated.
- 6.1.4 Potential direct effects upon designated sites, locally important sites and sensitive areas will be avoided where possible through the further consideration of routing and siting.
- 6.1.5 Recommendations for avoidance, mitigation, compensation and enhancement measures will be proposed to minimise any adverse effects on these identified ecological features. Where necessary, the significance of any residual effects will be assessed. Examples of potential mitigation approaches are described in this chapter; however, agreed mitigation proposals will be detailed within the EclA.
- 6.1.6 This chapter is supported by Figure 1.4 within Appendix B, and Appendix D and E.
- 6.1.7 This chapter should be read in conjunction with the following chapters due to the potential interrelationships of effects on biodiversity:
- *Chapter 5: Air Quality* includes detail of the potential impacts of altered air quality on sensitive ecological features, such as designated sites and ancient woodland;
 - *Chapter 7: Landscape and Visual* provides detail of essential mitigation and compensation that includes habitat creation, such as woodland planting, which is also of benefit to biodiversity features;
 - *Chapter 11: Water Environment* includes details of the location of sensitive features, including Water Framework Directive (WFD) waterbodies, and the associated mitigation that will also be required to address potential impacts on important ecological features, such as wetland Priority Habitats and aquatic fauna;
 - *Chapter 12: Marine Environment* includes details of the potential impacts on the marine environment including marine ecological features; and

- *Chapter 17: Climate Change* includes details on potential changes and trends in future baseline conditions and consideration of this with regard to the potential impacts and mitigation required for ecological features.

6.2 Legislation, Policy and Guidance

- 6.2.1 Relevant national, regional and local planning policies and guidance will also be considered as part of the EclA and will include (but will not be limited to) the documents summarised in the tables below:

Table 6-1: Legislation Relevant to Biodiversity

Legislation
Conservation of Habitats and Species Regulations 2017 (Habitats Regulations)
Wildlife and Countryside Act 1981 (WCA)
Countryside and Rights of Way Act 2000
The Natural Environment and Rural Communities Act 2006
Council Directive (92/43/EEC) on the Conservation of Natural Habitats and of Wild Fauna and Flora (Habitats Directive);
Council Directive (2009/147/EC) on the Conservation of Wild Birds (Birds Directive)
Conservation of Habitats and Species Amendment (EU Exit) Regulations 2019;
Environment Act 2021
The Hedgerows Regulations 1997
Protection of Badgers Act 1992 (as amended)

Biodiversity Net Gain

- 6.2.2 The Environment Act 2021 (Ref 6-1) includes provisions that make Biodiversity Net Gain (BNG) a mandatory requirement within the planning system in England requiring all relevant developments to achieve a minimum 10% net gain in biodiversity units relative to the site baseline biodiversity value. It is anticipated the secondary legislation mandating the need for 10% net gain for Development Consent Order (DCO) projects will be in place by May 2026 (delayed from November 2025 following a government consultation in summer 2025). As submission of the Peak Cluster DCO will be after this date, it is assumed that this will therefore apply.
- 6.2.3 Peak Cluster Limited has committed to 10% net gain in environmental value including as a minimum 10% BNG in line with the Environment Act 2021. This commitment is underpinned by the delivery of quantifiable enhancements for biodiversity measures from a baseline using the Department of Environment, Food and Rural Affairs (DEFRA) Statutory Biodiversity Metric (Ref 6-2) with actions formalised and secured by long term management arrangements with external organisations and partners.
- 6.2.4 Peak Cluster has engaged with regional and national stakeholders to discuss potential strategies to deliver BNG, including Nature North, Natural England, EA, Cheshire Wildlife Trust and Derbyshire Wildlife Trust.

Table 6-2: Planning Policy Relevant to Biodiversity

National Planning Policy
Overarching NPS for Energy (EN-1)
NPS for Natural Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4)
National Planning Policy Framework (NPPF) (2024)
Local Planning Policy
Staffordshire Moorlands Local Plan 2014-2033
High Peak Local Plan Adopted April 2016
Peak District National Park Local Development Framework Core Strategy 2011
Peak District National Park Development Management Policies May 2019
Derbyshire Dales District Council Adopted Local Plan 2017
Cheshire East Local Plan Strategy 2010-2030
Cheshire East Local Plan Site Allocations and Development Policies Document Adopted December 2022
Cheshire West and Chester Local Plan Part One Strategic Policies
Cheshire West and Chester Local Plan Part Two Land Allocations and Detailed Policies
Wirral Local Plan 2022 to 2040

Table 6-3: Relevant Standards and Guidance

Relevant Standards and Guidance
Chartered Institute of Ecology and Environmental Management (CIEEM) Good Practice Guidance for Habitats and Species
CIEEM Guidelines for Preliminary Ecological Appraisal (PEA)
CIEEM Guidelines for Ecological Impact Assessment in the UK and Ireland Terrestrial, Freshwater, Coastal and Marine
CIEEM Guidelines for accessing, using and sharing biodiversity data in the UK
Government Circular: Biodiversity and Geological Conservation – Statutory Obligations and their impact within the Planning System (Defra 01/2005, ODPM 06/2005)
A Green Future: Our 25 Year Plan to Improve the Environment (2018)

6.3 Defining the Study Area

- 6.3.1 The assessment will consider all the activities being conducted to facilitate the construction and operation of the Proposed Development, and the designated sites, habitats or species present that may be affected by those activities. The purpose is to ensure sufficient ecological baseline data is collated to inform the EcIA and determine the potential effects likely to occur within the relevant ZoI for each ecological feature.
- 6.3.2 The assessment will initially consider features within a potential ZoI of up to 15 km. This will be refined as the Proposed Development's design progresses, and the final EcIA Study Area will be determined based on the potential impacts, which, based upon a precautionary approach and

given the nature of the Proposed Development, is anticipated to be up to no further than 15 km from the Scoping Boundary. The 15 km distance has been determined based on professional judgement and experience of other similarly scaled projects and should be sufficient in which to assess all possible effects on ecology and biodiversity.

- 6.3.3 A desk study will identify European statutory designated sites within 15 km of the Scoping Boundary, seeking to address potential effects upon their qualifying features particularly those such as mobile species e.g. birds or bats (where the search area may be extended to 30 km) and/or designated habitats indirectly connected to the extent of the potential effects of the Proposed Development e.g. river catchments.
- 6.3.4 Nationally designated statutory sites will be searched for within 5 km of the Scoping Boundary. This includes Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR) and Local Nature Reserves (LNR).
- 6.3.5 A search for non-statutory designated sites, records of protected and notable species, granted European Protected Species licence applications, and ancient woodland within 2 km of the Scoping Boundary will be undertaken. Records of aquatic species comprising fish, macroinvertebrates and macrophytes will be reviewed within 10 km of the Scoping Boundary for Water Framework Directive (WFD) river catchments intersected by the Scoping Boundary.
- 6.3.6 Priority Habitat Inventory habitats will be searched for within 1 km of the Scoping Boundary.
- 6.3.7 The field survey area will include all land within the extent of the Proposed Development (subject to land access) plus at least a 50 m buffer (to check for species features with disturbance buffer zones such as badger *Meles meles*). Some species have specific geographical considerations and may dictate wider survey areas, for example ponds suitable to support great crested newt *Triturus cristatus* within 250 m of the draft Order Limits, and temporary construction areas, may need to be surveyed for their potential to support great crested newt.
- 6.3.8 These distances are based on widely accepted survey guidance applicable to different ecological species. Taxon-specific survey areas to be observed are detailed later in this section, some of which account for indirect impacts such as noise and air quality effects, where appropriate. The survey areas applied will ensure inclusion of all elements of the Proposed Development including both permanent and temporary land take.

6.4 Baseline Environment

- 6.4.1 An initial study of the biodiversity baseline environment has been undertaken through desk-based research, the sources of which are listed below:
 - Natural England website www.naturalengland.org.uk for information on statutory designated sites of nature conservation interest and to confirm reasons for designation and their condition;
 - Multi-Agency Geographic Information for the Countryside (MAGIC) website www.magic.gov.uk for information on the location of designated sites relevant to the Project Priority Habitats, ancient woodland and any other relevant information e.g. European Protected Species Mitigation (EPSM) licence records;
 - Joint Nature Conservation Committee website (<http://jncc.defra.gov.uk>) for information regarding any European designations within the desk study area;

- Planning Portals and local plans for any relevant information on designated sites and relevant planning policies and notable species within the Scoping Boundary; and
- EA Ecology and Fish Data Explorer (<https://environment.data.gov.uk/ecology/explorer/>) for records of aquatic species.

- 6.4.2 A more detailed desk study of the baseline biodiversity environment will be undertaken for the Preliminary Environmental Information Report (PEIR) and to assist in planning the surveys required for the EclA. This will include records obtained from the local record centres in addition to local and specialist recording groups e.g. for badger, amphibians, and/or bats.
- 6.4.3 The British Trust for Ornithology (BTO) Wetland Birds Survey (WeBS) for records of wetland birds at coastal and inland WeBS count sectors will also be obtained. The sectors for which data are obtained will depend on the availability of count data at each sector within the Study Area, which will be discussed with the relevant WeBS officer prior to purchase.
- 6.4.4 Local and specialist bird groups such as regional/county raptor monitoring groups (for example barn owl *Tyto alba* groups, the Barn Owl Trust and the Wildlife Conservation Partnership for records of barn owl) will also be contacted for further information.
- 6.4.5 The initial baseline is presented in Table 6-4 to Table 6-7. The location of sites designated for nature conservation is provided on Figure 1-4.

Table 6-4: Biodiversity Baseline Environment – Breedon Capture Facility

Designated Sites – Breedon Capture Facility		
Site Name	Reason for Designation	Approximate Distance and Direction from Scoping Boundary
International Statutory Designated Sites		
South Pennine Moors SAC	Annex I habitats that are a primary reason for selection: — European dry heaths — Blanket bogs Annex I habitats present as qualifying features: — Transition mires and quaking bogs — Old sessile oak woods with Ilex and Blechnum in the British Isles	2.8 km, north-east
Peak District Moors (South Pennine Moors Phase 1) SPA	The Peak District Moors SPA is designated for its importance as a breeding and wintering habitat for various bird species. The moorland habitats, including blanket bogs and heathlands, support significant populations of breeding birds such as golden plover <i>Pluvialis apricaria</i> , merlin <i>Falco columbarius</i> , and short-eared owl <i>Asio flammeus</i> .	2.8 km, north-east
Peak District Dales SAC	Annex I habitats that are a primary reason for selection:	2.9 km, south-west

Designated Sites – Breedon Capture Facility		
	— Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) — Tilio-Acerion forests of slopes, screes and ravines Annex I habitats present as qualifying features: — Calcareous rocky slopes with chasmophytic vegetation — European dry heaths	
National Statutory Designated Sites		
South Lee Meadows SSSI	South Lee Meadows SSSI is designated for its species-rich unimproved neutral grassland. The site supports a diverse range of grasses and herbs, including great burnet <i>Sanguisorba officinalis</i> , meadow foxtail <i>Alopecurus pratensis</i> , and common spotted orchid <i>Dactylorhiza fuchsii</i> . It represents a valuable example of traditionally managed hay meadow habitat in Staffordshire.	Within
Dirtlow Rake and Pindale SSSI	Dirtlow Rake and Pindale SSSI supports calcareous grassland but is designated for its geological interest, exposing mineral veins and associated features within Carboniferous limestone. The site provides insight into mineralisation processes and includes rare minerals such as fluorite and baryte. It is also important for its historical mining features.	Within
Castleton SSSI	Castleton SSSI spans approximately 5 km at the northernmost limit of the Carboniferous Limestone in the Peak District and is recognised as one of Britain's most significant earth science sites. It features notable rock formations, key geological landmarks such as Mam Tor, and areas of fossil and sedimentary interest. The site also holds considerable biological value, with species-rich grasslands supporting notable flora such as Jacob's ladder <i>Polemonium caeruleum</i> . Additionally, special habitats including old mineral workings and rocky outcrops with shallow soils, support metal-tolerant and diverse plant communities.	Within
Bradwell Dale and Bagshaw Cavern SSSI	The site consists of two elements which to some extent overlap. These are Bradwell Dale and, below ground, the cave system of Bagshaw Cavern. The Dale and its upstream	0.3 km east

Designated Sites – Breedon Capture Facility		
	continuation Stanlow Dale, are two deeply incised limestone gorges. They are located close to an interface between shale and limestone and owe their position to projecting 'reef-knolls' within the limestone which forced a constriction of the river and so formed the gorges. Previously the river had been migrating down the slope of the limestone beds at their junction with the shale, a process known as uniclinal shift which is unique to the Derbyshire limestone outcrop. Bradwell Dale is the best example of the effect of this process. The gorges are now completely dry, since all the water is taken underground through 'sinks' and drains through 3000 metres of cave passages known as Bagshaw Cavern. A number of 'feeder sinks' taking the water underground are located at Quarters Farm, Grindlow and Great Hucklow. The form of these passages is strongly controlled by the thinly bedded limestone and there are fine examples of tabular roof collapse. The cave also contains the finest straw stalactites in Derbyshire	
Oxlow Rake SSSI	Oxlow Rake is one of the largest remaining areas of vegetated lead rakes in the South Pennines, where an open vegetation characteristic of substrates rich in heavy metals occurs. On areas of lower toxicity, parts of the site support a closed turf similar to typical limestone grassland plant communities along with other communities characteristic of acid grassland. This intimate mix of different grassland types is a key feature of the site. At Oxlow Rake, the most notable of these metallophyte plants is spring sandwort or leadwort <i>Minuartia verna</i>, a species which throughout nearly all of its British distribution is confined to heavy-metal soils. The site also supports two further species which within the South Pennines are strongly associated with heavy-metal rich soils; mountain pansy <i>Viola lutea</i> and moonwort <i>Botrychium lunaria</i>. These species are found in a community comprising sheep's fescue <i>Festuca ovina</i>, common sorrel <i>Rumex acetosa</i>, ribwort plantain <i>Plantago lanceolata</i> and wild thyme <i>Thymus praecox</i>.	0.5 km north-west

Designated Sites – Breedon Capture Facility		
	Other undisturbed areas support acid grassland communities comprising wavy hairgrass <i>Deschampsia flexuosa</i> , sweet vernal-grass <i>Anthoxanthum odoratum</i> , red fescue <i>Festuca rubra</i> , heath bedstraw <i>Galium saxatile</i> , tormentil <i>Potentilla erecta</i> , and mountain pansy, including examples of the rarer blue flowered form. Disturbed areas of low heavy metal toxicity support a good calcareous grassland community of red fescue, sweet vernal-grass, common bird's-foot trefoil <i>Lotus corniculatus</i> , mouse-ear hawkweed <i>Hieracium pilosella</i> , bulbous buttercup	
Hallam Barn Grasslands SSSI	Hallam Barn Grasslands SSSI is designated for its species-rich grassland on clay soils within the Peak District National Park. The site supports a diverse assemblage of meadow plants including meadow vetchling <i>Lathyrus pratensis</i> , common knapweed <i>Centaurea nigra</i> , meadow buttercup <i>Ranunculus acris</i> , common bird's-foot trefoil, ox-eye daisy <i>Leucanthemum vulgare</i> , yellow rattle <i>Rhinanthus minor</i> , tormentil and common spotted orchid. Wetter areas support self-heal <i>Prunella vulgaris</i> , ragged robin <i>Lychnis flos-cuculi</i> , great burnet, meadowsweet <i>Filipendula ulmaria</i> , lesser trefoil <i>Trifolium dubium</i> , and wild angelica <i>Angelica sylvestris</i> , contributing to the site's biological interest.	0.8 km north-east
Bradwell Meadows SSSI	Bradwell Meadows, in the Peak District, are among the few remaining unimproved hay meadows in the area. The site features a complex pattern of neutral grassland types. It supports a variety of common grasses and herbs and consists of two fields, each with a distinct neutral grassland community. The eastern field is notable for supporting the locally uncommon adder's-tongue <i>Ophioglossum vulgatum</i> .	1 km south
Portway Mine SSSI	The excavation at Portway Mine has exposed a chaotic blocky infill of a hollow in the Carboniferous Limestone which was formed as a result of the collapse of a solution cavity some distance below the surface. Many of the blocks show excellent examples of pipe-vein mineralisation. Examination of the blocks	1.1km west

Designated Sites – Breedon Capture Facility		
	shows that ancient cavities in the rock were lined with baryte which developed in multiple layers showing a variety of forms and colours.	
Tideslow Rake SSSI	Tideslow Rake SSSI is designated for its lead rakes supporting calcareous grassland and metallophyte vegetation. The site includes species such as spring sandwort and alpine penny-cress <i>Noccaea caerulescens</i> , which are associated with metal-rich soils. The grassland supports common rock-rose <i>Helianthemum nummularium</i> , wild thyme <i>Thymus polytrichus</i> , and salad burnet <i>Sanguisorba minor</i> . The site is important for its botanical interest and historical mining features.	1.9 km south
Lee Farm Meadow, Tideswell SSSI	Lee Farm Meadow, Tideswell SSSI is designated for its unimproved neutral grassland, a rare habitat in Derbyshire. The meadow supports a diverse range of grasses and herbaceous plants, including species indicative of traditional hay meadows. The site is managed to maintain its floristic diversity and ecological integrity.	2.0 km south-west
River Derwent at Hathersage SSSI	River Derwent at Hathersage SSSI is designated for its fluvial geomorphology and associated habitats. The site includes gravel bars, riffles, and pools that support a range of aquatic species. It is also notable for its riparian vegetation and breeding populations of dipper <i>Cinclus cinclus</i> and grey wagtail <i>Motacilla cinerea</i> .	2.6 km east
Eastern Peak District Moors SSSI	Eastern Peak District Moors SSSI comprises extensive moorland habitats including blanket bog, heath, and acid grassland. The site supports breeding populations of upland birds such as curlew <i>Numenius arquata</i> , lapwing <i>Vanellus vanellus</i> , and red grouse <i>Lagopus scotica</i> . It is also important for its assemblage of lower plants and invertebrates and contributes to the ecological network of the South Pennine Moors.	2.8 km north-east
Dark Peak SSSI	The Dark Peak SSSI comprises extensive upland moorland habitats, including blanket bog, wet and dry heath, acid grassland, and flushes, forming part of the South Pennine Moors. The site supports internationally important	2.8 km north-west

Designated Sites – Breedon Capture Facility		
	breeding populations of merlin, golden plover, and short-eared owl. It also contains significant geological features and supports a rich assemblage of upland breeding birds, invertebrates, and lower plants. The site is of national importance for its size, habitat diversity, and the presence of rare and scarce species.	
Monk's Dale SSSI	Monk's Dale SSSI is a steep-sided limestone valley with ancient woodland and calcareous grassland. The site is notable for its rich lichen flora on shaded limestone cliffs and supports uncommon plants such as dark red helleborine <i>Epipactis atrorubens</i> . It forms part of the Derbyshire Dales National Nature Reserve and is important for woodland and grassland biodiversity.	3.0 km south-west
Abney & Bretton Cloughs SSSI	Abney and Bretton Cloughs lie on Millstone Grit and support a wide range of plant communities typical of gritstone/shale. Bretton Clough is noted for its species-rich flush and river mire communities. The lichen diversity is of exceptional interest, with rare species such as <i>Lecidea cinnabarina</i> , found only at this site within the National Park. The structural diversity of habitats means the valleys provide important breeding, feeding and roosting areas for around 60 species of birds, including kingfisher <i>Alcedo atthis</i> and snipe <i>Gallinago gallinago</i> . Several species of fly with restricted national distribution have been recorded at the site.	3.1 km south-east
Lower Hollins SSSI	Lower Hollins SSSI is a nationally important site for its lowland unimproved neutral grassland which mainly consists of the nationally scarce National Vegetation Classification (NVC) type MG5 crested dog's-tail <i>Cynosurus cristatus</i> – common knapweed <i>Centaurea nigra</i> grassland.	3.3 km north-west
Derbyshire Dales NNR	The Derbyshire Dales National Nature Reserve comprises five limestone valleys, namely Lathkill, Cressbrook, Monk's, Long and Hay Dales, within the Peak District National Park. These valleys are designated for their outstanding limestone scenery and ecological	3.5 km south-west

Designated Sites – Breedon Capture Facility		
	richness. The reserve supports diverse habitats including limestone grassland, scrub, valley woodlands, hay meadows, streams, dew ponds, scree, acid grassland and small areas of limestone heath. The flora is notably varied, and the site is important for butterflies and other insects.	
Waterfall Meadows SSSI	Waterfall Meadows SSSI is designated for its unimproved neutral grassland, which supports a diverse range of plant species including great burnet, meadow foxtail, and common spotted orchid. The site represents a rare example of traditionally managed hay meadows in Staffordshire, contributing significantly to the conservation of lowland meadow habitats.	4.7 km south-east
Edale SSSI	Edale SSSI includes a range of upland habitats such as blanket bog, heath, and acid grassland. The site supports breeding birds including golden plover and merlin and contains important geological exposures of Carboniferous rocks. It is also notable for its assemblage of lower plants and invertebrates.	4.8 km north-west
Priority Habitat Inventory Habitats – Breedon Capture Facility		
Habitat Name	Number of Habitat Parcels within 1 km	Approximate Closest Parcel to Boundary
Deciduous woodland	95	Within
Upland heathland	8	Within
Good quality semi-improved grassland	17	Within
Lowland calcareous grassland	18	Within
No main habitat but additional habitats present	32	Within
Traditional orchard	8	Within
Lowland meadows	28	Within
Calaminarian grassland	3	0.05 km, north
Lowland dry acid grassland	6	0.37 km, north
Fragmented heath	1	0.91 km, north-east
Grass moorland	1	0.92 km, north-east
Upland flushes fens and swamps	11	0.92 km, north

Designated Sites – Breedon Capture Facility		
Lowland fens	1	0.94 km, south-east
Ancient Woodland – Breedon Capture Facility		
No areas of woodland were identified within 2 km of the Scoping Boundary		

Table 6-5: Biodiversity Baseline Environment – Holcim Capture Facility

Designated Sites – Holcim Capture Facility		
Site Name	Reason for Designation	Approximate Distance and Direction from Scoping Boundary
International Statutory Designated Sites		
Peak District Dales SAC	Annex I habitats that are a primary reason for selection: — Semi-natural dry grasslands and scrubland facies on calcareous substrates (<i>Festuco-Brometalia</i>) — Tilio-Acerion forests of slopes, screes and ravines Annex I habitats present as qualifying features: — Calcareous rocky slopes with <i>chasmophytic vegetation</i> — European dry heaths	1.5 km, north-east
South Pennine Moors SAC	Annex I habitats that are a primary reason for selection: — European dry heaths — Blanket bogs Annex I habitats present as qualifying features: — Transition mires and quaking bogs — Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles	9.2 km, north
Peak District Moors (South Pennine Moors Phase 1) SPA	The Peak District Moors SPA is designated for its importance as a breeding and wintering habitat for various bird species. The moorland habitats, including blanket bogs and heathlands, support significant populations of breeding birds such as golden plover, merlin, and short-eared owl.	9.2 km, north
National Statutory Designated Sites		
Caldon Dales SSSI	Caldon Dales is a steep-sided dry valley on the southern edge of the Carboniferous Limestone dome in south Derbyshire and north Staffordshire. It is the only site of its kind in Staffordshire outside the National Park. The site supports a rare combination of unimproved calcareous and neutral grasslands, traditionally managed and now scarce in Staffordshire and the	Within

Designated Sites – Holcim Capture Facility		
	Midlands. It also contains one of the largest surviving examples of the meadow oat-grass-sheep's-fescue <i>Helictotrichon pratense</i>- <i>Festuca ovina</i> grassland community in the county. Caldon Dales also supports a rich variety of grasses, sedges, and herbs, with notable species such as common rock-rose and nationally restricted species such as spring cinquefoil <i>Potentilla neumanniana</i>. The least agriculturally modified areas of permanent pasture and hay meadows support nationally scarce neutral grassland. Numerous county-rare species are also present, such as rue-leaved saxifrage <i>Saxifraga tridactylites</i>. The site also supports a vigorous population of the nationally uncommon day-flying moth, the cistus forester moth <i>Adscita geryon</i>. The wide range of plant communities in such a small area also makes the site valuable for studying plant-environment relationships.	
Hamps and Manifold Valleys SSSI	Hamps and Manifold Valleys SSSI encompasses a range of habitats including calcareous grassland, woodland, and riverine environments. The site is notable for its limestone geology and supports a rich flora including several nationally scarce plant species. The valleys also provide important habitat for breeding birds and invertebrates.	0.5 km, east
Rue Hill SSSI	Rue Hill SSSI is a small site designated for its unimproved grassland habitat. The site supports a range of grassland species including crested dog's-tail <i>Cynosurus cristatus</i>, sweet vernal grass <i>Anthoxanthum odoratum</i>, and common knapweed. It is also notable for its populations of butterflies and other invertebrates.	0.7 km, south
Hofen's Croft Meadows LNR	A small, 1.4 hectare, area of meadow and scrub with open public access. The agriculturally unimproved meadow is managed for wildlife. A wide range of wildflowers have been recorded including meadow saxifrage <i>Saxifraga granulata</i>, marsh marigold, common spotted orchid, common twayblade <i>Neottia ovata</i>, and greater butterfly orchid <i>Platanthera chlorantha</i>.	1.1 km, south
Swineholes Wood and Black Heath SSSI	Swineholes Wood and Black Heath SSSI comprises ancient woodland and heathland habitats. The woodland includes sessile oak <i>Quercus petraea</i> and birch <i>Betula</i> sp. with a ground flora of bilberry <i>Vaccinium myrtillus</i> and wavy hair-grass <i>Deschampsia flexuosa</i>. Black Heath supports dry heath vegetation dominated by heather <i>Calluna vulgaris</i> and cross-leaved	1.7 km, west

Designated Sites – Holcim Capture Facility		
	heath Erica tetralix. The site is important for its structural diversity and associated fauna.	
Stanton Pastures & Cuckoocliff Valley SSSI	Stanton Pastures & Cuckoocliff Valley SSSI features a mosaic of calcareous grassland, acidic grassland, and broad-leaved woodland. The site supports a range of plant species including common rock-rose, salad burnet, and tormentil. The valley's topography and geology contribute to the diversity of habitats, which are important for invertebrates and breeding birds.	2.6 km, south-east
Churnet Valley SSSI	Churnet Valley SSSI is designated for its exceptional ecological and geological diversity. It contains the largest remaining concentration of semi-natural ancient woodland in Staffordshire, alongside a rich mosaic of grasslands, mires, and fen habitats. The site also features complex geological formations, including Carboniferous coal measures and sandstone outcrops. It supports a wide range of rare and nationally important plant species, diverse invertebrate communities, and over 50 breeding bird species.	3.1 km, west
Bath Pasture SSSI	Bath Pasture, in north Staffordshire, is a large, species-rich unimproved acid grassland featuring both wet and dry grassland communities- habitats that are now rare in lowland Staffordshire and lowland England due to agricultural changes. Over 100 species of higher plants have been recorded at the site, including several that are uncommon or rare in the county, such as heath spotted-orchid <i>Dactylorhiza maculata</i> and marsh lousewort <i>Pedicularis palustris</i> .	3.2 km, south
Whiston Eaves SSSI	Whiston Eaves SSSI is designated for its species-rich grassland and associated scrub and woodland habitats. The site supports a range of plant species characteristic of calcareous soils, including common rock-rose and salad burnet, and provides habitat for butterflies and other invertebrates.	4.5km south-west

Priority Habitat Inventory Habitats – Holcim Capture Facility		
Habitat Name	Number of Habitat Parcels within 1 km	Approximate Closest Parcel to Boundary
Deciduous woodland	30	Within
Good quality semi-improved grassland	12	Within
Lowland calcareous grassland	28	Within
No main habitat but additional habitats present	21	Within

Priority Habitat Inventory Habitats – Holcim Capture Facility		
Habitat Name	Number of Habitat Parcels within 1 km	Approximate Closest Parcel to Boundary
Lowland meadows	7	0.17 km, north-east
Coastal and floodplain grazing marsh	7	0.38 km, north-west
Ancient Woodland – Holcim Capture Facility		
One ancient woodland was identified within 2 km of the site, Railway Wood, located 2 km north-east of the site boundary.		
Granted European Protected Species Licences - Holcim Capture Facility		
No EPS licences were identified within the boundary. However, four EPS licences were identified within 2 km, one for great crested newt and the remaining three for bat species: common pipistrelle and brown long-eared bat. Closest EPS licence was located approximately 600 m north-east, granted for the destruction of a GCN resting place.		

Table 6-6: Biodiversity Baseline – Tarmac and Buxton Lime Capture Facilities

Designated Sites – Tarmac and Buxton Lime Capture Facility		
Site Name	Reason for Designation	Approximate Distance from Scoping Boundary
International Statutory Designated Sites		
Peak District Dales SAC	Annex I habitats that are a primary reason for selection: — Semi-natural dry grasslands and scrubland facies on calcareous substrates (<i>Festuco-Brometalia</i>) — <i>Tilio-Acerion</i> forests of slopes, screes and ravines Annex I habitats present as qualifying features: — Calcareous rocky slopes with <i>chasmophytic</i> vegetation — European dry heaths	0.2 km, south
South Pennine Moors SAC	Annex I habitats that are a primary reason for selection: — European dry heaths — Blanket bogs Annex I habitats present as qualifying features: — Transition mires and quaking bogs — Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles	4.4 km, west

Designated Sites – Tarmac and Buxton Lime Capture Facility		
Site Name	Reason for Designation	Approximate Distance from Scoping Boundary
International Statutory Designated Sites		
Peak District Moors (South Pennine Moors Phase 1) SPA	The Peak District Moors SPA is designated for its importance as a breeding and wintering habitat for various bird species. The moorland habitats, including blanket bogs and heathlands, support significant populations of breeding birds such as golden plover, merlin, and short-eared owl.	4.4 km, west
National Statutory Designated Sites		
Derbyshire Dales NNR	The Derbyshire Dales National Nature Reserve comprises five limestone valleys, namely Lathkill, Cressbrook, Monk's, Long and Hay Dales, within the Peak District National Park. These valleys are designated for their outstanding limestone scenery and ecological richness. The reserve supports diverse habitats including limestone grassland, scrub, valley woodlands, hay meadows, streams, dew ponds, scree, acid grassland and small areas of limestone heath. The flora is notably varied, and the site is important for butterflies and other insects.	2.7 km, north-east
The Wye Valley SSSI	The Wye Valley SSSI includes a range of habitats such as calcareous grassland, woodland, and riverine vegetation. The grassland supports species like wild thyme, fairy flax <i>Linum catharticum</i> , and common rock-rose. The woodland includes ash <i>Fraxinus excelsior</i> and field maple <i>Acer campestre</i> with a rich ground flora. The River Wye contributes to the site's ecological diversity and supports aquatic species.	0.2 km, south-west
Waterswallows Quarry SSSI	Waterswallows Quarry SSSI is of geological interest, exposing a sequence of Carboniferous limestone beds with fossil assemblages that provide insights into the palaeoenvironment of the Peak District. The site is important for stratigraphic studies and contributes to the understanding of the depositional history of the region's limestone formations.	0.3 km, south
Duchy Quarry SSSI	Duchy Quarry SSSI is of geological importance, exposing a sequence of Carboniferous limestone and associated mineral veins. The quarry provides evidence of mineralisation and tectonic activity, with visible fault structures and mineral deposits.	0.9 km, north

Designated Sites – Tarmac and Buxton Lime Capture Facility		
Site Name	Reason for Designation	Approximate Distance from Scoping Boundary
International Statutory Designated Sites		
	It is a key site for understanding the geological history of the Peak District.	
Topley Pike & Deep Dale SSSI	Topley Pike & Deep Dale SSSI comprises a deep limestone valley with calcareous grassland, woodland, and cliff habitats. The site supports a rich flora including several nationally rare and scarce plant species. It also contains important geological exposures of Carboniferous limestone and fossiliferous beds, contributing to the understanding of the region's geological history.	1.1 km, south
Monk's Dale SSSI	Monk's Dale SSSI is a steep-sided limestone valley with ancient woodland and calcareous grassland. The site is notable for its rich lichen flora on shaded limestone cliffs and supports uncommon plants such as dark red helleborine. It forms part of the Derbyshire Dales National Nature Reserve and is important for woodland and grassland biodiversity.	2.3 km, north-east
Calton Hill SSSI	Calton Hill is a largely-restored quarry of geological importance due to the presence of exceptionally rare rock types. Spinel lherzolites and harzburgites, found within basaltic lavas, originated from deep within the Earth's crust. This is the only known site in England where these rocks occur. The site also holds significant research value for understanding the structure and processes of volcanic complexes.	2.5 km, south-east
Ferneydale Grassland LNR	Species-rich grassland supporting wildflowers and butterflies, managed traditionally to maintain biodiversity.	3.7 km, south-west
Poole's Cavern and Grin Low Wood SSSI	Poole's Cavern and Grin Low Wood SSSI is designated for its geological and biological interest. The cavern is a major cave system in Carboniferous limestone, notable for its extensive and well-preserved speleothems including stalactites and stalagmites. Grin Low Wood supports broad-leaved woodland with a diverse ground flora typical of calcareous soils.	3.8 km, south-west
Lee Farm Meadow, Tideswell SSSI	Lee Farm Meadow, Tideswell SSSI is designated for its unimproved neutral grassland, a rare habitat in Derbyshire. The meadow supports a	4.3 km north-east

Designated Sites – Tarmac and Buxton Lime Capture Facility		
Site Name	Reason for Designation	Approximate Distance from Scoping Boundary
International Statutory Designated Sites		
	diverse range of grasses and herbaceous plants, including species indicative of traditional hay meadows. The site is managed to maintain its floristic diversity and ecological integrity.	
Goyt Valley SSSI	Goyt Valley SSSI includes a mosaic of upland habitats such as heath, grassland, and woodland. The site supports breeding birds including redstart <i>Phoenicurus phoenicurus</i> and pied flycatcher <i>Ficedula hypoleuca</i> , and contains geological exposures of Carboniferous rocks. It is also important for its assemblage of lower plants and invertebrates.	4.4 km west
Lower Peaslows Farm Meadow SSSI	Lower Peaslows Farm Meadow SSSI is a small but species-rich example of unimproved neutral grassland. The meadow supports a diverse flora including common knapweed, oxeye daisy, and yellow rattle, indicative of traditional hay meadow management. The site is important for conserving lowland meadow habitat in Derbyshire.	4.8 km north

Priority Habitat Inventory Habitats – Tarmac and Buxton Lime Capture Facility		
Habitat Name	Number of Habitat Parcels within 1 km	Approximate Closest Parcel to Boundary
Deciduous woodland	44	Within
Good quality semi-improved grassland	3	0.04 km south-west
Lowland calcareous grassland	13	0.14 km south
Lowland meadows	4	0.49 km south-west
No main habitat but additional habitats present	2	0.8 km south
Ancient Woodland – Tarmac and Buxton Lime Capture Facility		
Unnamed		1 km south
Topley Pike Wood		1.11 km south

Pigtor Wood	1.16 km south
Unnamed	1.46 km east
Ashwood Dale South	1.86 km south-west
Flag and Cheedale Woods	1.86 km east
Ashwood Dale South	1.91 km south-west
Granted European Protected Species Licences – Tarmac and Buxton Lime Capture Facility	
No EPS licences were identified within the Scoping Boundary. One EPS licence was identified within 2 km of the boundary, granted for destruction of a brown long-eared bat and common pipistrelle resting place, located 500 m north of the Scoping Boundary.	

Table 6-7: Biodiversity Baseline - Pipeline

Designated Sites – Pipeline		
Site Name	Reason for Designation	Approximate Distance and Direction from Scoping Boundary
International Statutory Designated Sites		
Peak District Dales SAC	Annex I habitats that are a primary reason for selection: — Semi-natural dry grasslands and scrubland facies on calcareous substrates (<i>Festuco-Brometalia</i>) — Tilio-Acerion forests of slopes, screes and ravines Annex I habitats present as qualifying features: — Calcareous rocky slopes with <i>chasmophytic</i> vegetation — European dry heaths	0.02 km, south-east
Dee Estuary SAC (including marine element)	Annex I habitats that are a primary reason for selection: — Estuaries — Mudflats and sandflats not covered by seawater at low tide — Atlantic salt meadows — Salicornia and other annuals colonising mud and sand Annex I habitats present as qualifying features: — Sandbanks which are slightly covered by sea water all the time Coastal lagoons Annex II species present as qualifying features: — Sea lamprey <i>Petromyzon marinus</i> — River lamprey <i>Lampetra fluviatilis</i>	0.15 km, north
Mersey Narrows & North Wirral Foreshore SPA (including marine element)	This SPA is designated for its importance to various waterbird species, particularly during migration and wintering periods. The area encompasses intertidal mudflats, sandbanks, and saltmarshes, providing critical feeding and roosting sites for a range of waterbirds. These habitats support significant populations of migratory and wintering species, contributing to the site's ecological significance. The designation for this SPA names 11 Annex II bird	0.16 km, north

Designated Sites – Pipeline		
	species that are present within the site, covering both breeding and wintering populations. These species include Eurasian oystercatcher <i>Haematopus ostralegus</i> , grey plover <i>Pluvialis squatarola</i> , dunlin <i>Calidris alpina</i> , redshank <i>Tringa totanus</i> and black-tailed godwit <i>Limosa limosa</i> . The site supports a waterbird assemblage of approximately 32,000 individuals.	
Mersey Narrows & North Wirral Foreshore Ramsar	Mersey Narrows & North Wirral Foreshore qualifies as a Ramsar under the following criterion: — Criterion 4: The site regularly supports plant and/or animal species at a critical stage in their life cycles, or provides refuge during adverse conditions. The site supports important numbers of non-breeding little gull <i>Hydrocoloeus minutus</i> and common tern <i>Sterna hirundo</i>. — Criterion 5: The site regularly supports 20,000 or more waterbirds. During the winters 2004/5 to 2008/9, the site supported an average peak of 32,402 individual waterbirds. — Criterion 6: The site regularly supports 1% of the individuals in the populations of the following species or subspecies of waterbird in any season. Namely, 2.4% of the islandica subspecies and 2.8% of the lapponica subspecies W Europe/NW Africa (non-breeding) population of bar-tailed godwits <i>Limosa lapponica</i>.	0.16 km, north
Liverpool Bay SPA (including marine element)	Liverpool Bay SPA is designated for its significance as a habitat for various bird species, particularly migratory and wintering waterfowl. The estuary spans extensive mudflats, saltmarshes, and reedbeds, creating a nutrient-rich environment that supports a diverse range of avian species. The SPA also supports large populations of waterbirds during migration seasons, an internationally important assemblage of approximately 70,000 waterbirds. Annex II species listed as present within the site include red-throated diver <i>Gavia stellata</i> , common scoter <i>Melanitta nigra</i> , little gull, common tern and little tern <i>Sternula albifrons</i> .	0.9 km, north-west
The Dee Estuary SPA (including marine element)	The Dee Estuary SPA is designated primarily for its importance as a habitat for various bird species, particularly migratory and wintering waterfowl. The estuary encompasses extensive mudflats, sandbanks, and saltmarshes, providing essential feeding and roosting sites for a range of waterbirds. The SPA supports significant populations of migratory and wintering species, contributing to the site's ecological significance. The designation for this	2.3 km, south-west

Designated Sites – Pipeline		
	SPA names 15 Annex II bird species that are present within the site, covering both breeding and wintering populations. These species include dunlin, Eurasian oystercatcher, shelduck <i>Tadorna tadorna</i> and redshank. The site also supports a waterbird assemblage of approximately 90,000 individuals.	
The Dee Estuary Ramsar	The Dee Estuary qualifies as a Ramsar Site under the following criterion: — Criterion 1: Extensive intertidal mud and sand flats (20 km by 9 km) with large expanses of saltmarsh towards the head of the estuary. Habitats Directive Annex I features present on the SAC include estuaries (H1130), mudflats and sandflats not covered by seawater at low tide (H1140), annual vegetation of drift lines (H1210), vegetated sea cliffs of the Atlantic and Baltic coasts (H1230) and salicornia and other annuals colonising mud and sand (H1310), among others. — Criterion 2: The site supports breeding colonies of the vulnerable natterjack toad <i>Bufo calamita</i>.	2.3 km, south-west
Peak District Moors (South Pennine Moors Phase 1) SPA	The Peak District Moors SPA is designated for its importance as a breeding and wintering habitat for various bird species. The moorland habitats, including blanket bogs and heathlands, support significant populations of breeding birds such as golden plover, merlin, and short-eared owl.	3.1 km, south
South Pennine Moors SAC	Annex I habitats that are a primary reason for selection: — European dry heaths — Blanket bogs Annex I habitats present as qualifying features: — Transition mires and quaking bogs — Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles	3.1 km, north
River Dee and Bala Lake SAC	Annex I habitats that are a primary reason for selection: — Watercourses of plain to montane levels with the <i>Ranunculus fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation Annex II species that are a primary reason for selection: — Atlantic salmon <i>Salmo salar</i>	3.0 km, south-west

Designated Sites – Pipeline		
	— Brook lamprey <i>Lampetra planeri</i> — River lamprey — Sea lamprey — Bullhead <i>Cottus gobio</i> — Otter <i>Lutra lutra</i> — Floating water-plantain <i>Luronium natans</i>	
Midland Meres & Mosses – Phase 1 Ramsar	Midland Meres & Mosses - Phase 1 qualified as a Ramsar Site under the following criterion: — Criterion 1. The site comprises a diverse range of habitats from open water to raised bog. — Criterion 2. Supports a number of rare species of plants associated with wetlands including five nationally scarce species, together with an assemblage of rare wetland invertebrates.	3.1 km, south
Mersey Estuary Ramsar	The Mersey Estuary qualifies as a Ramsar Site under the following criterion: — Criterion 5. The wetland regularly supports more than 20,000 waterbirds. Lower Derwent Valley supports approximately 32,000 wintering waterfowl. — Criterion 6. The wetland regularly supports 1% of the individuals in a population of one species/subspecies of waterbird. This criterion applies to two bird species present within the site, Eurasian wigeon <i>Anas penelope</i> and Eurasian teal <i>Anas crecca</i>.	3.7 km, north-east
Mersey Estuary SPA (including marine element)	The Mersey Estuary SPA is designated primarily for its significant populations of overwintering and migratory bird species, which utilise the estuary's extensive mudflats, saltmarshes, and brackish marshlands for feeding and roosting. The SPA designation acknowledges the estuary's role as a key habitat for species such as Eurasian teal, northern pintail <i>Anas acuta</i>, dunlin, redshank, and Eurasian oystercatcher, which are present in internationally important numbers. These habitats support large numbers of birds, making it a critical stopover and wintering site along migratory routes. The estuary supports populations of 14 different Annex II species listed on the designation, including breeding and overwintering birds, as well as some populations that are present on passage.	3.7 km, north-east
Oak Mere SAC	Annex I habitats that are a primary reason for selection:	6.6 km, north

Designated Sites – Pipeline		
	— Natural eutrophic lakes with <i>Magnopotamion</i> or <i>Hydrocharition</i>-type vegetation Annex II species present as qualifying features: — Great crested newt	
Midland Meres & Mosses – Phase 2 Ramsar	Midland Meres & Mosses - Phase 1 qualified as a Ramsar Site under the following criterion: — Criterion 1. The site comprises a diverse range of habitats from open water to raised bog. — Criterion 2. Supports a number of rare species of plants associated with wetlands, including the nationally scarce cowbane <i>Cicuta virosa</i> and, elongated sedge <i>Carex elongata</i>. Also present are the nationally scarce bryophytes <i>Dicranum affine</i> and <i>Sphagnum pulchrum</i>. Also supports an assemblage of invertebrates including several rare species. There are 16 species of British Red Data Book insect listed for this site including the following endangered species: the moth <i>Glyphipteryx lathamella</i>, the caddisfly <i>Hagenella clathrata</i> and the sawfly <i>Trichiosoma vitellinae</i>.	6.6 km, north
West Midlands Mosses SAC	Annex I habitats that are a primary reason for selection: — Transition mires and quaking bogs	8.1 km, north
Sefton Coast SAC	Annex I habitats that are a primary reason for selection: — Embryonic shifting dunes — Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (“white dunes”) — Fixed coastal dunes with herbaceous vegetation (“grey dunes”) — Dunes with <i>Salix</i> spp. — Humid dune slacks Annex I habitats present as qualifying features: — Atlantic salt meadows — Salicornia and other annuals colonising mud and sand	8.4 km, north-east
Ribble & Alt Estuaries SPA (including Marine Element)	This site is designated primarily for its importance as a habitat for a variety of waterbirds, especially during winter and migration periods. The estuary supports significant populations of 29 different Annex II species, including populations of overwintering, breeding and wading species. The site is noted to support a seabird assemblage of	8.4 km, north-east

Designated Sites – Pipeline		
	approximately 29,000 individuals, and a waterbird assemblage of approximately 324,000 individuals. Overall, the estuary's intertidal zones, saltmarshes, and other wetland habitats offer food and protection for birds, enhancing their chances of survival during seasonal migrations.	
Ribble & Alt Estuaries Ramsar	Ribble & Alt Estuaries qualifies as a Ramsar Site under the following criterion: — Criterion 2. The wetland supports vulnerable, endangered or critically endangered species or threatened ecological communities. This site supports up to 40% of the Great Britain population of natterjack toad. — Criterion 5. The wetland regularly supports more than 20,000 waterbirds. Ribble & Alt Estuaries supports approximately 89,500 wintering waterfowl. — Criterion 6. The wetland regularly supports 1% of the individuals in a population of on species/subspecies of waterbird. This criterion applies to six bird species present within the site.	8.4 km, north-east
Rostherne Mere Ramsar	Rostherne Mere qualified as a Ramsar Site under the following criterion: — Criterion 1: Rostherne Mere is one of the deepest and largest of the meres of the Shropshire-Cheshire Plain. Its shoreline is fringed with common reed <i>Phragmites australis</i>.	13.7 km, north-west
National Statutory Designated Sites		
Meols Meadows SSSI	Meols Meadows SSSI comprises damp unimproved neutral grassland and is the best example of the crested dog's-tail-common knapweed type of grassland known in Merseyside and Greater Manchester. The site supports a diverse flora including red clover <i>Trifolium pratense</i> , meadow vetchling, and sweet vernal grass, and is important for the conservation of lowland meadow habitat.	Within
Thurstaston Common SSSI	Thurstaston Common SSSI includes lowland heath, acid grassland, and woodland habitats. The heath is dominated by heather and cross-leaved heath, with areas of bracken <i>Pteridium aquilinum</i> and gorse <i>Ulex</i> sp. The woodland includes oak <i>Quercus</i> sp. and birch <i>Betula</i> sp. with a ground flora of wavy hair-grass and wood sorrel <i>Oxalis acetosella</i> . The site supports a range of invertebrates and breeding birds.	Within

Designated Sites – Pipeline		
Thurstaston Common LNR	Lowland heath and woodland habitats supporting heather, birch, and associated wildlife, with views over the Wirral.	Within
Hallwood Farm Marl Pit SSSI	Hallwood Farm Marl Pit SSSI is a small but ecologically significant site designated for its rich aquatic flora. The marl pit supports a diverse range of submerged and emergent plant species, including stoneworts and other aquatic macrophytes. The surrounding grassland and hedgerows enhance the site's biodiversity, providing habitat for invertebrates and amphibians.	Immediately adjacent
South Lee Meadows SSSI	South Lee Meadows SSSI is designated for its species-rich unimproved neutral grassland. The site supports a diverse range of grasses and herbs, including great burnet, meadow foxtail, and common spotted orchid. It represents a valuable example of traditionally managed hay meadow habitat in Staffordshire.	Immediately adjacent
Sandbach Flashes SSSI	Sandbach Flashes SSSI comprises a series of subsidence flashes formed by brine extraction. The site supports a range of aquatic and marginal habitats and is important for wintering wildfowl such as shoveler <i>Anas clypeata</i> and teal. It also includes areas of reedbed and wet grassland supporting breeding birds and invertebrates.	Immediately adjacent
Monk's Dale SSSI	Monk's Dale SSSI is a steep-sided limestone valley with ancient woodland and calcareous grassland. The site is notable for its rich lichen flora on shaded limestone cliffs and supports uncommon plants such as dark red helleborine. It forms part of the Derbyshire Dales National Nature Reserve and is important for woodland and grassland biodiversity.	0.02 km, south
Caldon Dales SSSI	Caldon Dales is a steep-sided dry valley on the southern edge of the Carboniferous Limestone dome in south Derbyshire and north Staffordshire. It is the only site of its kind in Staffordshire outside the National Park. The site supports a rare combination of unimproved calcareous and neutral grasslands, traditionally managed and now scarce in Staffordshire and the Midlands. It also contains one of the largest surviving examples of the meadow oat-grass-sheep's-fescue grassland community in the county. Caldun Dales also supports a rich variety of grasses, sedges, and herbs, with notable species such as common rock-rose and nationally restricted species such as spring cinquefoil. The least agriculturally modified areas of permanent pasture and hay meadows support nationally scarce neutral grassland. Numerous county-rare species are also present, such as rue-leaved saxifrage. The	0.06 km, east

Designated Sites – Pipeline		
	site also supports a vigorous population of the nationally uncommon day-flying moth, the cistus forester moth. The wide range of plant communities in such a small area also makes the site valuable for studying plant-environment relationships.	
Combs Reservoir SSSI	Combs Reservoir SSSI, located south-east of Whaley Bridge, supports one of very few sites in Britain with an unusual community of short-lived mosses and liverworts known as ephemeral bryophytes. These species are characteristic of the muddy drawdown zone exposed during drought, with the rare moss <i>Physcomitrium sphaericum</i> being particularly notable. The reservoir margins also support the only known county site for a rare mudwort <i>Limosella</i> sp.. A mix of woodland, grassland and water-margin habitats provides breeding grounds for over 40 bird species, including waterbirds and species associated with marshy grasslands.	0.11 km, south-west
Millennium Wood, Disley LNR	A community woodland planted to mark the millennium, supporting native trees and woodland wildlife.	0.13 km, south
North Wirral Foreshore SSSI	North Wirral Foreshore SSSI comprises extensive intertidal sand and mudflats, saltmarsh, and boulder clay cliffs. The site supports internationally important feeding grounds for waders and waterbirds, including bar-tailed godwit and knot <i>Calidris canutus</i> . It provides ecosystem services such as shoreline stabilisation and sediment trapping.	0.16 km, north
Gleads Moss SSSI	Gleads Moss SSSI comprises lowland raised bog habitat, supporting a range of bog vegetation including Sphagnum mosses, common cotton-grass <i>Eriophorum angustifolium</i> , and heather. The site is important for its hydrological integrity and supports breeding birds and invertebrates associated with bog habitats.	0.21 km, north-west
River Dane SSSI	River Dane SSSI is designated for its fluvial geomorphology and aquatic habitats. The river supports a diverse range of aquatic and marginal vegetation and is important for species such as brown trout <i>Salmo trutta</i> and kingfisher. The site includes riverbank exposures of geological interest.	0.21 km, south
Toddbrook Reservoir SSSI	Toddbrook Reservoir SSSI comprises open water, marginal vegetation, and surrounding grassland. The reservoir supports wintering wildfowl such as tufted duck <i>Aythya fuligula</i> and pochard <i>Aythya ferina</i> . The marginal vegetation includes reedmace <i>Typha</i> sp. and water	0.34 km, south-east

Designated Sites – Pipeline		
	mint <i>Mentha aquatica</i> . The grassland supports species such as knapweed and common bird's-foot-trefoil. The site is important for its aquatic habitats and associated fauna.	
Lee Farm Meadow, Tideswell SSSI	Lee Farm Meadow, Tideswell SSSI is designated for its unimproved neutral grassland, a rare habitat in Derbyshire. The meadow supports a diverse range of grasses and herbaceous plants, including species indicative of traditional hay meadows. The site is managed to maintain its floristic diversity and ecological integrity.	0.38 km, south
Brough Park Fields LNR	Grassland and scrub habitats supporting wildflowers and pollinators, with public access for walking and wildlife observation.	0.39 km, south
Biddulph Valley Way (Whitemoor) LNR	A linear nature reserve along a disused railway line, supporting grassland and woodland habitats important for local wildlife and recreation.	0.41 km, south-west
Oxlow Rake SSSI	Oxlow Rake is one of the largest remaining areas of vegetated lead rakes in the South Pennines, where an open vegetation characteristic of substrates rich in heavy metals occurs. On areas of lower toxicity, parts of the site support a closed turf similar to typical limestone grassland plant communities along with other communities characteristic of acid grassland. This intimate mix of different grassland types is a key feature of the site. At Oxlow Rake, the most notable of these metallophyte plants is spring sandwort or leadwort, a species which throughout nearly all of its British distribution is confined to heavy-metal soils. The site also supports two further species which within the South Pennines are strongly associated with heavy-metal rich soils; mountain pansy and moonwort. These species are found in a community comprising sheep's fescue, common sorrel, ribwort plantain and wild thyme. Other undisturbed areas support acid grassland communities comprising wavy hairgrass, sweet vernal-grass, red fescue, heath bedstraw, tormentil, and mountain pansy, including examples of the rarer blue flowered form. Disturbed areas of low heavy metal toxicity support a good calcareous grassland community of red fescue, sweet vernal-grass, common bird's-foot trefoil, mouse-ear hawkweed, bulbous buttercup.	0.47 km, north-west
Hamps and Manifold Valleys SSSI	Hamps and Manifold Valleys SSSI encompasses a range of habitats including calcareous grassland, woodland, and riverine environments. The site is notable for its limestone geology and supports a rich flora including several nationally scarce plant species. The valleys also provide important habitat for breeding birds and invertebrates.	0.47 km, east

Designated Sites – Pipeline		
Poynton Coppice LNR	Ancient woodland with a diverse ground flora, supporting woodland birds and invertebrates.	0.56 km,north-west
Wimboldsley Wood SSSI	Wimboldsley Wood SSSI is an ancient semi-natural woodland on clay soils, supporting a diverse ground flora including dog's mercury <i>Mercurialis perennis</i> , wood sorrel, and early purple orchid <i>Orchis mascula</i> . The site is notable for its structural complexity and continuity of woodland habitat, contributing to the conservation of lowland broadleaved woodland in Cheshire.	0.56 km, west
Danes Moss SSSI	Danes Moss is part of a nationally important series of open water and peatland habitats in the north-west Midlands. The site includes varied habitats which support populations of Cheshire's scarcer insects and locally uncommon wetland plants, making Danes Moss a valuable example of a habitat now rare in lowland England.	0.61 km, south-east
Madams Wood SSSI	Madams Wood SSSI is designated for its ancient semi-natural woodland, which includes a mix of oak <i>Quercus</i> sp., ash, and hazel <i>Corylus avellana</i> . The ground flora is rich and includes bluebell <i>Hyacinthoides non-scripta</i> , wood anemone <i>Anemonoides nemorosa</i> , and dog's mercury. The site supports a range of woodland birds and invertebrates and represents a valuable remnant of native woodland in the region.	0.71 km, west
Dirtlow Rake and Pindale SSSI	Dirtlow Rake and Pindale SSSI supports calcareous grassland but is designated for its geological interest, exposing mineral veins and associated features within Carboniferous limestone. The site provides insight into mineralisation processes and includes rare minerals such as fluorite and baryte. It is also important for its historical mining features.	0.78 km, north-west
Rue Hill SSSI	Rue Hill SSSI is a small site designated for its unimproved grassland habitat. The site supports a range of grassland species including crested dog's-tail, sweet vernal grass, and common knapweed. It is also notable for its populations of butterflies and other invertebrates.	0.81 km, south
Brookfield Pond LNR	A small pond and surrounding grassland providing habitat for amphibians, aquatic plants, and wetland birds.	0.81 km, south
Dane-in-Shaw Pasture SSSI	Dane-in-Shaw Pasture SSSI is one of the largest and most botanically diverse areas of flushed neutral grassland remaining in lowland Cheshire. The site supports a range of grassland communities, from moderately species-rich neutral grassland to more acidic and	0.82 km, west

Designated Sites – Pipeline		
	wet tall-herb vegetation. These habitats are important for locally distributed plant species and support a diversity of insects, including strong colonies of butterflies with restricted distribution in Cheshire.	
Toddbrook Reservoir SSSI	The site is one of a very few in Britain which periodically support an unusual community of short-lived mosses and liverworts. Such 'ephemeral bryophyte' communities are characteristic of the muddy draw-down zones of a few reservoirs and ponds, but are well documented only at Toddbrook and one other nearby site. The most characteristic species is the rare moss <i>Physcomitrium sphaericum</i> which is only known from very few localities. It was first recorded here in 1893 and has reappeared intermittently since, when summer droughts have produced a muddy substrate suitable for this group of short-lived bryophytes. These include the mosses <i>Pseudephemerum nitidum</i> and <i>Physcomitrella patens</i> , and the liverworts <i>Riccia sorocarpa</i> and <i>Blasia pusilla</i> .	0.87 km, south
Stanney Wood LNR	Ancient woodland with a rich ground flora and canopy of oak <i>Quercus</i> sp. and birch <i>Betula</i> sp., supporting woodland birds and fungi.	0.88 km, north
Castleton SSSI	Castleton SSSI spans approximately 5 km at the northernmost limit of the Carboniferous Limestone in the Peak District and is recognised as one of Britain's most significant earth science sites. It features notable rock formations, key geological landmarks such as Mam Tor, and areas of fossil and sedimentary interest. The site also holds considerable biological value, with species-rich grasslands supporting notable flora such as Jacob's ladder. Additionally, special habitats including old mineral workings and rocky outcrops with shallow soils, support metal-tolerant and diverse plant communities.	0.91 km, north
Bradwell Meadows SSSI	Bradwell Meadows SSSI, in the Peak District, are among the few remaining unimproved hay meadows in the area. The site features a complex pattern of neutral grassland types. It supports a variety of common grasses and herbs and consists of two fields, each with a distinct neutral grassland community. The eastern field is notable for supporting the locally uncommon adder's-tongue.	1.02 km, east
Wettenhall and Darnhall Woods SSSI	Wettenhall and Darnhall Woods SSSI comprises ancient semi-natural woodland on poorly drained soils, supporting a rich ground flora including bluebell, yellow archangel <i>Lamium galeobdolon</i> , and wood anemone. The site is important for its structural diversity and	1.03 km, north-west

Designated Sites – Pipeline		
	continuity of woodland habitat, providing valuable breeding and foraging grounds for woodland birds and invertebrates.	
Dibbinsdale SSSI	Dibbinsdale SSSI comprises ancient semi-natural woodland and wetland habitats along the River Dibbin. The site supports a diverse ground flora including bluebell, wild garlic <i>Allium ursinum</i> , and yellow archangel, and provides habitat for breeding birds and invertebrates. The woodland is dominated by oak <i>Quercus</i> sp. and ash, with alder <i>Alnus glutinosa</i> in wetter areas, and represents one of the best examples of valley woodland in Merseyside.	1.06 km, east
Derbyshire Dales NNR	The Derbyshire Dales National Nature Reserve comprises five limestone valleys, namely Lathkill, Cressbrook, Monk's, Long and Hay Dales, within the Peak District National Park. These valleys are designated for their outstanding limestone scenery and ecological richness. The reserve supports diverse habitats including limestone grassland, scrub, valley woodlands, hay meadows, streams, dew ponds, scree, acid grassland and small areas of limestone heath. The flora is notably varied, and the site is important for butterflies and other insects.	1.08 km, south
Jackson's Brickworks LNR	A former industrial site now supporting ponds, woodland, and grassland, providing habitat for amphibians and dragonflies.	1.22 km, north-west
Goytside Meadows LNR	Unimproved grassland meadows supporting a range of grasses and herbs, important for pollinators and breeding birds.	1.23 km, north
Lower Peaslows Farm Meadow SSSI	Lower Peaslows Farm Meadow SSSI is a small but species-rich example of unimproved neutral grassland. The meadow supports a diverse flora including common knapweed, oxeye daisy, and yellow rattle, indicative of traditional hay meadow management. The site is important for conserving lowland meadow habitat in Derbyshire.	1.26 km, north-west
Combes Valley SSSI	Combes Valley SSSI features ancient broadleaved woodland, grasslands, and a steep valley carved through Upper Carboniferous strata. The site supports a high diversity of woodland birds, including redstart, pied flycatcher and wood warbler <i>Phylloscopus sibilatrix</i> , as well as nationally important beetles and uncommon and geographically restricted moths and butterflies. Its varied habitats, shaped by complex geology and historical land use, provide vital breeding, feeding and nesting grounds for a wide range of flora and fauna.	1.29 km, south

Designated Sites – Pipeline		
Tideslow Rake SSSI	Tideslow Rake SSSI is designated for its lead rakes supporting calcareous grassland and metallophyte vegetation. The site includes species such as spring sandwort and alpine penny-cress, which are associated with metal-rich soils. The grassland supports common rock-rose, wild thyme, and salad burnet. The site is important for its botanical interest and historical mining features.	1.42 km, south
Swineholes Wood and Black Heath SSSI	Swineholes Wood and Black Heath SSSI comprises ancient woodland and heathland habitats. The woodland includes sessile oak and birch with a ground flora of bilberry and wavy hair-grass. Black Heath supports dry heath vegetation dominated by heather and cross-leaved heath. The site is important for its structural diversity and associated fauna.	1.42 km, south-west
Hofen's Croft Meadows LNR	Traditional hay meadows supporting a range of grasses and herbs, important for butterflies and other invertebrates.	1.45 km, south-west
Holly Banks SSSI	Holly Banks SSSI is designated for its ancient woodland and associated ground flora. The site supports a variety of native tree species and a rich understorey including bluebells, wood anemone, and wild garlic. The woodland structure and diversity provide habitat for birds, mammals, and invertebrates.	1.46 km, south
Stubbins Park LNR	Grassland and woodland habitats supporting wildflowers, butterflies, and birds, with public access for recreation.	1.46 km, north-east
Riverside Park, Macclesfield LNR	A linear park along the River Bollin, supporting riparian habitats and providing green space for wildlife and people.	1.65 km, south-east
Mousley Bottom LNR	A riverside reserve with wet woodland and grassland, supporting amphibians, birds, and aquatic plants.	1.69 km, north
Rivacre Valley LNR	Woodland and grassland habitats along a stream valley, supporting birds, mammals, and wildflowers.	1.77 km, east
The Wye Valley SSSI	The Wye Valley SSSI includes a range of habitats such as calcareous grassland, woodland, and riverine vegetation. The grassland supports species like wild thyme, fairy flax, and common rock-rose. The woodland includes ash and field maple with a rich ground flora. The River Wye contributes to the site's ecological diversity and supports aquatic species.	1.84 km, south

Designated Sites – Pipeline		
Thorncliffe Moor SSSI	Thorncliffe Moor SSSI comprises upland heath and acid grassland. The heath is dominated by heather and bilberry, while the grassland includes mat-grass <i>Nardus stricta</i> and heath bedstraw. The site supports breeding birds such as curlew and snipe and is important for its representation of upland vegetation communities.	1.86 km, north-east
The Dungeon SSSI	The Dungeon SSSI is a steep-sided wooded valley with base-rich flushes and calcareous grassland. The woodland includes ash and hazel with a ground flora of wild garlic, early-purple orchid, and sanicle <i>Sanicula europaea</i> . The flushes support species such as marsh marigold <i>Caltha palustris</i> and opposite-leaved golden-saxifrage <i>Chrysosplenium oppositifolium</i> . The site is notable for its varied topography and plant communities.	2.05 km, south
Hallam Barn Grasslands SSSI	Hallam Barn Grasslands SSSI is designated for its species-rich grassland on clay soils within the Peak District National Park. The site supports a diverse assemblage of meadow plants including meadow vetchling, common knapweed, meadow buttercup, common bird's-foot trefoil, ox-eye daisy, yellow rattle, tormentil, and common spotted orchid. Wetter areas support self-heal, ragged robin, great burnet, meadowsweet, lesser trefoil, and wild angelica, contributing to the site's biological interest.	2.08 km, north-east
Peckforton Woods SSSI	Peckforton Woods SSSI is an extensive area of ancient semi-natural woodland on sandstone, supporting a diverse assemblage of trees including sessile oak, birch <i>Betula</i> sp., and holly <i>Ilex aquifolium</i> . The ground flora includes bilberry, bracken, and wood sorrel. The site is important for woodland birds and invertebrates and represents a significant woodland habitat in Cheshire.	2.18 km, south
Brotherton Park and Dibbinsdale LNR	A mix of ancient woodland and wetland habitats along the River Dibbin, supporting diverse flora and fauna and offering educational access.	2.18 km, north
Whitby Park LNR	Urban parkland with mature trees, grassland, and ornamental planting, providing habitat for birds and pollinators.	2.1 km, north
Dee Cliffs SSSI	Dee Cliffs SSSI, located on the eastern side of the Dee Estuary, is the best-known example of clay cliff and bank habitat in Merseyside. The site includes marl pits with a rich flora and fauna and an area of herb-rich neutral grassland. The cliffs expose a sequence of strata within the Lower Triassic Chester Pebble Beds Formation, comprising sandstones and pebbly sandstones with large-scale cross-stratification and erosion surfaces. These features	2.2 km, south-west

Designated Sites – Pipeline		
	provide valuable insights into the sedimentary structures of sandy braided rivers typical of the Lower Triassic period.	
Dee Estuary SSSI	The Dee Estuary SSSI is a large, estuary of major importance for its extensive intertidal sand and mudflats, saltmarshes, and associated habitats. It supports internationally important numbers of wintering and passage waterfowl and waders, including bar-tailed godwit, redshank, and shelduck. The estuary also includes breeding colonies of common, little, and sandwich terns <i>Thalasseus sandvicensis</i> . The site plays a vital role in sediment trapping, shoreline stabilisation, and supports a range of saltmarsh vegetation types.	2.31 km, south-west
Red Rocks SSSI	Red Rocks SSSI is designated for its coastal habitats, including sand dunes and reedbeds. The site supports a range of wetland plants, including the nationally rare hybrid bulrush. It is also important for breeding birds such as reed warbler <i>Acrocephalus scirpaceus</i> and sedge warbler <i>Acrocephalus schoenobaenus</i> .	2.33 km, west
Brereton Heath LNR	A former sand quarry now featuring a lake, heathland, and woodland, supporting dragonflies, birds, and heathland plants.	2.36 km, south
Burton Mill Wood LNR	Ancient woodland with a rich ground flora, supporting woodland birds and invertebrates.	2.41 km, south-west
Heswall Dales SSSI	Heswall Dales SSSI is designated for its lowland heath habitat, one of the best remaining examples in Merseyside. The site supports heather, bell heather <i>Erica cinerea</i> , bilberry, and western gorse <i>Ulex gallii</i> , with birch scrub and gorse <i>Ulex</i> sp. providing important breeding habitat for birds.	2.54 km, south
Gannister Quarry SSSI	Gannister Quarry SSSI is designated for its geological interest, exposing the Gannister Beds of the Carboniferous period. The site provides insight into sedimentary structures and fossil content, including plant fossils. It is an important location for understanding the depositional environment of the Carboniferous period.	2.74 km, south-west
Goyt Valley SSSI	Goyt Valley SSSI includes a mosaic of upland habitats such as heath, grassland, and woodland. The site supports breeding birds including redstart and pied flycatcher, and contains geological exposures of Carboniferous rocks. It is also important for its assemblage of lower plants and invertebrates.	2.76 km, south

Designated Sites – Pipeline		
Ladderedge Country Park LNR	A mosaic of woodland, grassland, and wetland habitats supporting birds, mammals, and wildflowers.	2.78 km, south
Heswall Dales LNR	Lowland heath habitat supporting heather, bilberry, and gorse with panoramic views over the Dee Estuary.	2.88 km, south
Stanton Pastures & Cuckoocliff Valley SSSI	Stanton Pastures & Cuckoocliff Valley SSSI features a mosaic of calcareous grassland, acidic grassland, and broad-leaved woodland. The site supports a range of plant species including common rock-rose, salad burnet, and tormentil. The valley's topography and geology contribute to the diversity of habitats, which are important for invertebrates and breeding birds.	2.93 km, south-east
Abney & Bretton Cloughs SSSI	Abney and Bretton Cloughs lie on Millstone Grit and support a wide range of plant communities typical of gritstone/shale. Bretton Clough is noted for its species-rich flush and river mire communities. The lichen diversity is of exceptional interest, with rare species such as <i>Lecidea cinnabarina</i> , found only at this site within the National Park. The structural diversity of habitats means the valleys provide important breeding, feeding and roosting areas for around 60 species of birds, including kingfisher and snipe. Several species of fly with restricted national distribution have been recorded at the site.	2.96 km, south-east
Topley Pike & Deep Dale SSSI	Topley Pike & Deep Dale SSSI comprises a deep limestone valley with calcareous grassland, woodland, and cliff habitats. The site supports a rich flora including several nationally rare and scarce plant species. It also contains important geological exposures of Carboniferous limestone and fossiliferous beds, contributing to the understanding of the region's geological history.	3.01 km, south-east
River Dee (England) SSSI	River Dee (England) SSSI is designated for its aquatic biodiversity and geomorphological features. The river supports populations of Atlantic salmon and otter and includes gravel riffles and marginal wetlands. It is also important for its assemblage of aquatic invertebrates.	3.03 km, south-west
Bagmere SSSI	The Meres and Mosses of the north-west Midlands form an internationally important network of over 60 open water bodies and several peatland sites. Fringing habitats such as reedswamp, fen, carr, and damp pasture add to the value of the area. Bagmere is a peat-filled basin of a formerly larger mere, with a small area of open water remaining,	3.06 km, south

Designated Sites – Pipeline		
	surrounded by rich fen, marshy grassland, and carr woodland. The fen vegetation includes notable species such as purple small-reed <i>Calamagrostis canescens</i> , while the marshy grassland supports species that are rare in Cheshire, including great burnet and greater spearwort <i>Ranunculus lingua</i> . Bagmere also supports a small breeding colony of the small pearl-bordered fritillary butterfly <i>Boloria selene</i> , a nationally declining species, which was last recorded in Cheshire at this site.	
Dark Peak SSSI	The Dark Peak SSSI comprises extensive upland moorland habitats, including blanket bog, wet and dry heath, acid grassland, and flushes, forming part of the South Pennine Moors. The site supports internationally important breeding populations of merlin, golden plover, and short-eared owl. It also contains significant geological features and supports a rich assemblage of upland breeding birds, invertebrates, and lower plants. The site is of national importance for its size, habitat diversity, and the presence of rare and scarce species.	3.08 km, north
Churnet Valley SSSI	Churnet Valley SSSI is designated for its exceptional ecological and geological diversity. It contains the largest remaining concentration of semi-natural ancient woodland in Staffordshire, alongside a rich mosaic of grasslands, mires, and fen habitats. The site also features complex geological formations, including Carboniferous coal measures and sandstone outcrops. It supports a wide range of rare and nationally important plant species, diverse invertebrate communities, and over 50 breeding bird species.	3.18 km, south-west
Watford Lodge LNR	Grassland and wetland habitats supporting amphibians, birds, and wildflowers, managed for biodiversity and public access.	3.19 km, north
Leek Moors SSSI	Leek Moors SSSI comprises extensive upland moorland habitats within the Staffordshire Moorlands. The site supports an outstanding assemblage of upland breeding birds, including golden plover and snipe.	3.22 km, north-east
Bidston Moss LNR	A restored landfill site now supporting reedbeds, grassland, and woodland, providing habitat for birds and invertebrates and offering public access for nature enjoyment.	3.25 km, east
Hilbre Islands LNR	A group of tidal islands supporting seabirds, grey seals <i>Halichoerus grypus</i> , and maritime vegetation, designated for their coastal biodiversity.	3.38 km, south-west
Inner Marsh Farm SSSI	Inner Marsh Farm SSSI is a wetland site of high ornithological value, managed as a nature reserve by the RSPB. It supports significant populations of black-tailed godwit, pintail, and	3.47 km, south-west

Designated Sites – Pipeline		
	teal, particularly during winter and migration periods. The site's freshwater pools and reedbeds provide ideal conditions for breeding and feeding waterfowl.	
River Derwent at Hathersage SSSI	River Derwent at Hathersage SSSI is designated for its fluvial geomorphology and associated habitats. The site includes gravel bars, riffles, and pools that support a range of aquatic species. It is also notable for its riparian vegetation and breeding populations of dipper and grey wagtail.	3.51 km, east
Bath Pasture SSSI	Bath Pasture, in north Staffordshire, is a large, species-rich unimproved acid grassland featuring both wet and dry grassland communities- habitats that are now rare in lowland Staffordshire and lowland England due to agricultural changes. Over 100 species of higher plants have been recorded at the site, including several that are uncommon or rare in the county, such as heath spotted-orchid and marsh lousewort.	3.5 km, south-west
Roe Park Woods SSSI	Roe Park Woods SSSI comprises ancient semi-natural woodland on calcareous soils. The site supports a diverse ground flora including bluebell, wild garlic, and early purple orchid. It is also important for breeding birds and invertebrates associated with mature woodland habitats.	3.62 km, south-west
Mersey Estuary SSSI	The Mersey Estuary SSSI is a large, sheltered estuary with extensive areas of saltmarsh and intertidal sand and mudflats. It supports internationally important numbers of wintering and passage waterbirds, including shelduck, redshank, and dunlin. The site also includes brackish marsh, rocky shoreline, and cliffs, and plays a vital role in sediment trapping and shoreline stabilisation.	3.65 km, north-east
Eastern Peak District Moors SSSI	Eastern Peak District Moors SSSI comprises extensive moorland habitats including blanket bog, heath, and acid grassland. The site supports breeding populations of upland birds such as curlew, lapwing, and red grouse. It is also important for its assemblage of lower plants and invertebrates and contributes to the ecological network of the South Pennine Moors.	4.15 km, north-east
Poole's Cavern and Grin Low Wood SSSI	Poole's Cavern and Grin Low Wood SSSI is designated for its geological and biological interest. The cavern is a major cave system in Carboniferous limestone, notable for its extensive and well-preserved speleothems including stalactites and stalagmites. Grin Low Wood supports broad-leaved woodland with a diverse ground flora typical of calcareous soils.	4.32 km, south-west

Designated Sites – Pipeline		
Ferneydale Grassland LNR	Species-rich grassland supporting wildflowers and butterflies, managed traditionally to maintain biodiversity.	4.37 km, south-west
Waterfall Meadows SSSI	Waterfall Meadows SSSI is designated for its unimproved neutral grassland, which supports a diverse range of plant species including great burnet, meadow foxtail, and common spotted orchid. The site represents a rare example of traditionally managed hay meadows in Staffordshire, contributing significantly to the conservation of lowland meadow habitats.	4.48 km, south-east
Lindow Common LNR	Areas of heather are present in addition to other habitats, which add to the Common's richness – a fringe of woodland, wet mires and Black Lake.	4.52 km, north-west
New Ferry SSSI	New Ferry SSSI is designated for its intertidal mudflats and saltmarsh habitats, which support important populations of wintering waterbirds. The site includes areas of brackish marsh and is part of the Mersey Estuary SPA. It plays a key role in supporting bird assemblages and maintaining estuarine ecological functions.	4.54 km, north-east
Lower Hollins SSSI	Lower Hollins SSSI is a nationally important site for its lowland unimproved neutral grassland which mainly consists of the nationally scarce National Vegetation Classification (NVC) type MG5 crested dog's-tail <i>Cynosurus cristatus</i> – common knapweed <i>Centaurea nigra</i> grassland.	4.58 km, north-west
Bluebell Woods LNR	Ancient woodland known for its seasonal bluebell displays, supporting native tree species and woodland flora.	4.58 km, north
Little Budworth Common SSSI	Little Budworth Common SSSI is designated for its lowland heath vegetation, which is now a rare habitat in Cheshire. The site supports a mosaic of dry heath dominated by heather with areas of acid grassland and birch scrub. The heathland supports a range of characteristic plant species and provides habitat for a variety of invertebrates and birds.	4.73 km, north
Cressbrook Dale SSSI	Cressbrook Dale SSSI is part of the White Peak, one of Britain's most important Carboniferous limestone landscapes. The dale features a rich mosaic of ash-dominated woodland, species-rich limestone grassland, scrub, rock outcrops and streams. The site is notable for its high density of woodland birds, diverse insect populations, and rare plant species associated with limestone and mine spoil. Cressbrook Dale is also one of the most important geological sites in Derbyshire, with a well-exposed sequence of Brigantian	4.89 km, south

Designated Sites – Pipeline		
	limestones and volcanic layers that have provided key insights into ancient marine and volcanic environments.	
Stoney Middleton Dale SSSI	Stoney Middleton Dale SSSI is designated for its extensive limestone woodland and calcareous grassland. The woodland includes ash and wych elm <i>Ulmus glabra</i> with a rich ground flora of dog's mercury, woodruff <i>Galium odoratum</i> , and herb-paris <i>Paris quadrifolia</i> . The grassland supports species such as small scabious <i>Scabiosa columbaria</i> and clustered bellflower <i>Campanula glomerata</i> . The site also contains geological exposures of Carboniferous limestone.	4.89 km, south-east
Happy Valley LNR	Woodland and grassland habitats on a steep valley slope, supporting native trees, wildflowers, and bird species.	4.99 km, north-west
Whiston Eaves SSSI	Whiston Eaves SSSI is designated for its species-rich grassland and associated scrub and woodland habitats. The site supports a range of plant species characteristic of calcareous soils, including common rock-rose and salad burnet, and provides habitat for butterflies and other invertebrates.	4.9 km, south-west

Priority Habitat Inventory Habitats – Pipeline		
Habitat Name	Number of Habitat Parcels within 1 km	Approximate Closest Parcel to Boundary
Ponds	50	Within
Coastal and floodplain grazing marsh	135	Within
Upland heathland	15	Within
Traditional orchard	76	Within
Good quality semi-improved grassland	1,185	Within
Grass moorland	11	Within
Lowland calcareous grassland	45	Within
Lowland dry acid grassland	37	Within
Deciduous woodland	1,645	Within
Lowland raised bog	38	Within
Purple moor grass and rush pastures	12	Within
No main habitat but additional habitats present	2,493	Within
Lowland fens	49	Within
Lowland heathland	53	Within
Lowland meadows	75	Within
Upland flushes fens and swamps	11	0.11 km, east
Blanket bog	9	0.13 km, south-west
Calaminarian grassland	4	0.67 km, east
Upland hay meadow	1	0.93 km, south-west

Ancient Woodland – Pipeline	
Habitat Name	Approximate Closest Parcel to Boundary
Unnamed	Within
Hapsley Wood	Within
Unnamed	Within
Unnamed	Within
Unnamed	Immediately adjacent
Hills Wood	Within
Polestead Wood	Immediately adjacent
Edge End and Solomon's Woods	Within

Ancient Woodland – Pipeline	
Habitat Name	Approximate Closest Parcel to Boundary
Unnamed	Immediately adjacent
Blakehey Wood	Within
Bowshot Wood	Immediately adjacent
Unnamed	Immediately adjacent
Hesky and Hammerpool Woods	0.01km, north-west
Unnamed	Within
Edge End and Solomon's Woods	Within
Unnamed	Immediately adjacent
Barns Wood	Immediately adjacent
Polestead Wood	Immediately adjacent
Bowshot Wood	Immediately adjacent
Dickens Wood	0.01 km, north-west
Unnamed	0.02 km, south-east
Unnamed	0.02 km, south-east
Weaver Bank	0.02 km, north-east
Barns wood	0.02 km, south-west
Weaver Wood Rookery	0.03 km, south-east
Unnamed	0.03 km, east
Fairboroughs wood	0.04 km, north-west
Key Green Wood	0.06 km, north-east
Bollinhurst wood	0.06 km, south-west
Back Hills wood	0.07 km, south-west
Ryles and Middlecale Woods	0.07 km, north-east
Nab wood	0.08 km, east
Hungerhill Wood	0.09 km, west
Big Wood	0.09 km, north
Unnamed	0.10 km, south-west
Highlees Wood	0.11 km, west
Unnamed	0.16 km, south-west
Bens Wood	0.14 km, north west
Unnamed	0.16 km, south-east
Platt wood	0.17 km, north west
Pigeon House Clough	0.21 km, south
Minshull Hall Farm Wood	0.22 km, south-east
Coalpit Clough	0.22 km, south

Ancient Woodland – Pipeline	
Habitat Name	Approximate Closest Parcel to Boundary
Cock Wood	0.25 km, east
Whibbings wood	0.31 km, south-west
Brook House Wood	0.35 km, west
Unnamed	0.36 km, east
Stanthorne Hall Farm	0.36 km, north-west
Unnamed	0.49 km, north
Unnamed	0.39 km, north-west
Unnamed	0.4 km, south-east
Hind`s Clough Wood	0.43 km, north
Unnamed	0.44 km, south-west
Simpsons Rough/Foxey Wood	0.45 km, south-east
Ryecroft Wood	0.46 km, south
Park Clough	0.50 km, east
Unnamed	0.49 km, north
Elm Wood	0.52 km, north-west
Unnamed	0.52 km, south-west
Unnamed	0.55 km, north-west
Ashmore heath	0.56 km, north
Unnamed	0.56 km, north
Rookery/Small Rookery Woods	0.58 km, west
Unnamed	0.59 km, north-west
Unnamed	0.61 km, south-east
Worsley Covert	0.62 km, south
Hillside Wood	0.64 km, west
Unnamed	0.70 km, south-west
Biddulph Brook Wood	0.70 km, west
Unnamed	0.70 km, north-west
Unnamed	0.72 km, south-west
Madams/Havannah Woods	0.72 km, west
Unnamed	0.74 km, east
Wood Farm Wood	0.74 km, west
Unnamed	0.74 km, south
Unnamed	0.75 km, south-east
Mudhouse Wood	0.79 km, south-west
Plymyard Dale	0.79 km, north-east

Ancient Woodland – Pipeline	
Habitat Name	Approximate Closest Parcel to Boundary
Unnamed	0.83 km, west
Unnamed	0.84 km, south-west
Trelfas Wood	0.86 km, north-west
Unnamed	0.88 km, north
Page`s Wood	0.88 km, north-east
Peckerpool wood	0.90 km, north-east
Beech Wood	0.93 km, north-east
Unnamed	0.94 km, west
Tittesworth wood	0.96 km, north-east
Hapsley Wood	1.0 km, south-east
Brookside Woods	1.02 km, north-west
Unnamed	1.03 km, south-east
Unnamed	1.02 km, south-east
North/Engine Woods	1.03 km, south
Unnamed	1.04 km, north-west
Unnamed	1.05 km, north-east
Foxes Wood	1.06 km, east
Scar Wood	1.07 km, south
Unnamed	1.09 km, north
Unnamed	1.09 km, east
Unnamed	1.10 km, south
Simons Wood	1.13 km, north
Unnamed	1.16 km, north
Unnamed	1.16 km, south-east
Unnamed	1.16 km, south
Shirkley Wood	1.17 km, south
Oak Clump	1.17 km, west
Unnamed	1.18 km, north-east
Fair View Wood	1.24 km, south-west
Heath Hey Wood	1.42 km, south
Shotwick Dale	1.27 km, south-west
Harrop Wood	1.30 km, south
Double Wood	1.33 km, west
Thornton Wood, Intake Wood	1.33 km, north-east
Spring Wood	1.37 km, south

Ancient Woodland – Pipeline	
Habitat Name	Approximate Closest Parcel to Boundary
Holly Banks	1.40 km, south
Unnamed	1.42 km, north-west
Stanleyhall Wood	1.46 km, north
Ravensclough Wood	1.48 km, east
Unnamed	1.49 km, north-west
Unnamed	1.50 km, south-west
Unnamed	1.50 km, south-east
Unnamed	1.52 km, east
Wettenhall Wood	1.52 km, north-west
Potter Hey Wood	1.52 km, north
Beardwood	1.53 km, north
Dingle Wood	1.55 km, south
Brandylee Wood	1.56 km, north
Stanney Wood	1.57 km, north
Unnamed	1.57 km, south-west
Ballington Wood	1.60 km, south-west
Sixoaks and Backhill Woods	1.65 km, south-west
Fadge Clough	1.65 km, north
Round Wood	1.71 km, north
Stream Wood	1.72 km, north
Rudyard Wood	1.73 km, south-west
Unnamed	1.80 km, east
Shallcross and Park Woods	1.84 km, south-west
Willocks Wood	1.88 km, south-west
Pool Wood	1.88 km, south
Cowhay Wood	1.94 km, south-west
Railway Wood	1.98 km, north-east
Upton Wood	1.99 km, east

Granted European Protected Species Licences – Pipeline	
— EPSM2012-3945 for the destruction of a brown long-eared bat and common pipistrelle roost (23/01/2012-01/02/2014). — EPSM2013-5987 for the destruction of a GCN resting place (06/08/2013-31/10/2015) — EPSM2009-1573 for the destruction and damage of a brown long-eared bat resting place (03/02/2010-31/01/2012) — 2020-49675-EPS-MIT for the destruction of a common pipistrelle resting place (30/10/2020-30/10/2025).	Within the pipeline Scoping Boundary
A total of 229 granted EPS licences were identified within 2 km of the pipeline Scoping Boundary. Of these, 98 were for great crested newt, and the remaining 131 were for various bat species, including: brown long-eared bat, common pipistrelle, Daubenton's bat <i>Myotis daubentonii</i>, lesser horseshoe bat <i>Rhinolophus hipposideros</i>, Natterer's bat, soprano pipistrelle, Leisler's bat <i>Nyctalus leisleri</i>, whiskered bat <i>Myotis mystacinus</i> and Brandt's bat <i>Myotis brandtii</i>. Bat records were distributed fairly evenly throughout the 2km search boundary, whereas great crested newt records were more concentrated towards the north-western extent of the pipeline boundary.	Within 2 km of the pipeline Scoping Boundary

6.5 Aquatic Ecology Baseline

- 6.5.1 The Scoping Boundary at the time of writing intersects 45 WFD river waterbody catchments which may potentially be directly or indirectly impacted by the Proposed Development (Appendix F). At this stage, the exact nature, location and extent of watercourse impacts is not known. Consequently, the list of potentially impacted river waterbody catchments will be updated as this information becomes available.
- 6.5.2 A search of EA fish, invertebrate and macrophyte records for these 45 river waterbody catchments has been undertaken using data from within 10 km of the Scoping Boundary. This forms the Aquatic Ecology Desk Study Area for this scoping report. A gap analysis has been performed to indicate the availability of data for each receptor from within the last ten years (Appendix F). Where no data was available within the last ten years, a search was made for older records within those catchments. As per CIEEM guidance (Ref 6-3), ecological records older than three years should be considered out of date. However, the historical presence / absence of notable protected or invasive species does provide valuable insight into the nature of the river catchments in question and indicates the potential for those species to remain present. The need for updated survey information will be determined when a full list of potential watercourse impacts is available.
- 6.5.3 The following ecological baseline serves to indicate the presence of notable protected or invasive species present in river waterbody catchments intersected by the Scoping Boundary as well as highlighting gaps in aquatic species records, both from within the last ten years and throughout all previous survey records.

Gap Analysis Results

Fish

- 6.5.4 Of the 45 river waterbody catchments intersected by the Scoping Boundary, 22 have EA electrofishing data available from within the last ten years and within 10 km of the Scoping Boundary. Of the remaining 23 catchments, 14 have data available that is older than 2015. There are ten river catchments for which no electrofishing data was available within the search area.

Macrophytes

- 6.5.5 For EA Macrophyte surveys, 33 river waterbody catchments have data available from within the last ten years and within 10 km of the Scoping Boundary. Five of the remaining catchments have data available from before 2015. Seven catchments have no macrophyte data available within the search area.

Invertebrates

- 6.5.6 In terms of invertebrate data availability, 40 of the river waterbody catchments intersected by the Scoping Boundary have data available from within the last ten years. Three of the remaining catchments have data available from before 2015. Two river waterbody catchments have no invertebrate records available within the search area.

Conclusion

- 6.5.7 A number of data gaps have been identified in the EA's existing aquatic ecology records for the catchments outlined in Appendix F. The need for additional ecological surveys will be determined once more information becomes available regarding the potential impacts on watercourses.

Notable Species

- 6.5.8 An initial review of notable species present within the river waterbody catchments intersected by the project has been undertaken (Table 6-8). This list should not be considered exhaustive due to the data gaps outlined above. A more detailed review of notable species present within each river waterbody catchment will be provided in the next stage of assessment when the pipeline route corridor is further refined.

Table 6-8: Notable species identified within the Aquatic Desk Study Area

Species	Scientific Name	Receptor Type	Rationale
Brown / sea trout	<i>Salmo trutta</i>	Fish	Brown trout are listed as a 'species of principal importance' under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006. Sea trout are afforded additional protection under the Salmon & Freshwater Fisheries Act 1975 (as amended). This act prohibits capture or disturbance without proper authority.
Bullhead	<i>Cottus gobio</i>	Fish	Bullhead are listed under Annex II of the EC Habitats Directive (European Commission, 1992), which is

Species	Scientific Name	Receptor Type	Rationale
			transposed into English law by The Conservation of Habitats and Species Regulations 2017 (HMSO, 2017). Species listed under Annex II are considered to be of community interest and whose conservation requires the designation of Special Areas of Conservation (SAC).
Lamprey sp.	Not identified to species, could refer to <i>Lampetra planeri</i> or <i>Lampetra fluviatilis</i>	Fish	Species listed under Annex II are considered to be of community interest and whose conservation requires the designation of Special Areas of Conservation (SAC).
Brook lamprey	<i>Lampetra planeri</i>	Fish	Lamprey are difficult to identify to species during electrofishing surveys. Lamprey sp. in EA fish records could indicate the presence of brook lamprey (<i>Lampetra planeri</i> , see below) or river lamprey (<i>Lampetra fluviatilis</i>). River lamprey is listed as Near Threatened on the IUCN Red List and classified under the Habitats Directive Annex 2. River lamprey is protected under the Salmon & Freshwater Fisheries Act 1975 (as amended). Listed as a 'species of principal importance' under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006.
Brook lamprey	<i>Lampetra planeri</i>	Fish	Habitats Directive Annex 2 IUCN Red List – Near Threatened. Salmon & Freshwater Fisheries Act 1975
European eel	<i>Anguilla anguilla</i>	Fish	IUCN Red List – Critically endangered. Protected under The Eels (England and Wales) Regulations 2009 and managed under various Eel Management Plans in the UK.
Goldfish	<i>Carassius auratus</i>	Fish	Invasive Non-Native Species (INNS)
Bitterling	<i>Rhodeus sericeus</i>	Fish	INNS.

Species	Scientific Name	Receptor Type	Rationale
Nuttall's waterweed	<i>Elodea nuttallii</i>	Macrophyte	INNS.
Least duckweed	<i>Lemna minuta</i>	Macrophyte	INNS.
Canadian waterweed	<i>Elodea canadensis</i>	Terrestrial plant (associated with watercourses)	INNS, WCA, Schedule 9.
Himalayan balsam	<i>Impatiens glandulifera</i>	Terrestrial plant (associated with watercourses)	INNS, WCA, Schedule 9.
Japanese knotweed	<i>Reynoutria japonica</i>	Terrestrial plant (associated with watercourses)	INNS, WCA, Schedule 9.
Mimulus	<i>Mimulus guttatus</i>	Terrestrial plant (associated with watercourses)	INNS.
Giant hogweed	<i>Heracleum mantegazzianum</i>	Terrestrial plant (associated with watercourses)	INNS, WCA Schedule 9
Glutinous snail	<i>Myxas glutinosa</i>	Invertebrate	Listed in WCA. Schedule 5 (fully protected); NERC Act S41 species of principal importance; GB Red Data Book: Critically Endangered NOTE: Species is considered extinct in England.
Asian clam	<i>Corbicula fluminea</i>	Invertebrate	INNS. Disrupts sediment, outcompetes native bivalves.
Florida amphipod	<i>Crangonyx floridanus</i>	Invertebrate	INNS. Spreads rapidly displacing native amphipods.
North American amphipod	<i>Crangonyx pseudogracilis</i>	Invertebrate	Widespread INNS; less aggressive than <i>C. floridanus</i> but can displace native fauna.
Demon shrimp	<i>Dikerogammarus haemobaphes</i>	Invertebrate	INNS. Predatory amphipod that alters food webs, outcompetes native gammarids.
Killer shrimp	<i>Dikerogammarus villosus</i>	Invertebrate	INNS. Similar to Demon shrimp.
Zebra mussel	<i>Dreissena polymorpha</i>	Invertebrate	INNS.
Tiger shrimp	<i>Gammarus tigrinus</i>	Invertebrate	INNS. Competes with native amphipods.

Species	Scientific Name	Receptor Type	Rationale
Freshwater polychaete	<i>Hypania invalida</i>	Invertebrate	INNS.
Signal crayfish	<i>Pacifastacus leniusculus</i>	Invertebrate	INNS. Spreads crayfish plague <i>Aphanomyces astaci</i> , displaces native white-clawed crayfish <i>Austropotamobius pallipes</i> .
Bladder snail	<i>Physella acuta</i>	Invertebrate	Widespread non-native; tolerant of pollution, competes with native snails.
Tadpole snail	<i>Physella gyrina</i>	Invertebrate	Non-native. Potentially invasive in disturbed habitats.
New Zealand mud snail	<i>Potamopyrgus antipodarum</i>	Invertebrate	INNS. Widespread in the UK.

6.6 Identification of Potential Effects

6.6.1 The potential environmental effects will be assessed within the subsequent ES for the construction, operational and decommissioning phases of the Proposed Development. At this stage, it is identified that the Proposed Development has the potential to result in effects on biodiversity features as set out below.

Construction:

- Loss of habitat, loss/fragmentation of habitat supporting protected and notable species as a result of permanent and temporary land take, surface water and groundwater pollution, and dust emissions;
- Killing/injury of protected and notable species as a result of permanent and temporary land take;
- Loss of functionally linked land used by bird species listed as qualifying species of European designated sites;
- Disturbance to designated sites, protected and notable species as a result of construction noise and lighting; and
- Degradation of habitats, legal offence to plant or otherwise allow to spread in the wild due to the spread of invasive non-native plant species.

Operation:

- Loss of functionally linked land used by bird species listed as qualifying species of European designated sites; and
- Disturbance to protected and notable species e.g., roosting/ foraging bats due to noise / visual disturbance.

Decommissioning:

- Same as construction, but with enhancement opportunities associated with any re-instatement works (e.g. at AGI locations).

6.7 Scope and Methodology

6.7.1 This section outlines the scope and methodology that will be employed for assessing the likely significant effects associated with biodiversity.

Scope

6.7.2 The scope as set out below is based on the information at the time of writing and is therefore written in advance of a detailed desk study including the gathering of records of protected and notable species and non-statutory designated sites. It is also written in advance of analysis of any field survey data (wintering bird surveys commenced October 2025 as detailed in Section 6.7 below). In line with the precautionary principle, the majority of ecological features are therefore scoped into the assessment.

Methodology

6.7.3 Potential impacts on important ecological features will be assessed in accordance with CIEEM best practice guidance (Ref 6-4). The aims of the EclA are to:

- identify relevant ecological features (i.e. designated sites, habitats, species or ecosystems) which may be impacted as a consequence of the Proposed Development;
- provide a scientifically rigorous and transparent assessment of the likely ecological impacts and resultant effects of the Proposed Development, which may be beneficial (i.e. positive) or adverse (i.e. negative);
- facilitate scientifically rigorous and transparent determination of the consequences of the Proposed Development in terms of national, regional and local policies relevant to nature conservation and biodiversity, where the level of detail provided is proportionate to the scale of the development and the complexity of its potential impacts; and
- set out the steps to be taken to adhere to legal requirements relating to the relevant ecological features concerned.

6.7.4 It is not necessary in the assessment to address all habitats and species with potential to occur in the zone of influence of a proposed development. Instead, the focus should be on those that are 'relevant'. CIEEM guidance makes it clear that there is no need to "carry out detailed assessment of ecological features that are sufficiently widespread, unthreatened and resilient to project impacts and will remain viable and sustainable". This does not mean that efforts should not be made to safeguard wider biodiversity, and requirements for this will be considered. National policy documents emphasise the need to achieve no net loss of biodiversity and enhancement of biodiversity.

6.7.5 To support focussed EclA, there is a need to determine the scale at which the ecological features identified through the desk studies and field surveys are of value. The value of each ecological feature will be defined with reference to the geographical level at which it matters, and the results of this assessment will be used to identify the relevant features requiring impact assessment. The frames of reference that will be used for this assessment, based on CIEEM guidance, are:

- International (generally this is within a European context, reflecting the general availability of good data to allow cross-comparison);
- National (Great Britain, but considering the potential for certain ecological features to be more notable (of higher value) in an England context relative to Great Britain as a whole);
- Regional (e.g. North-West, East Midlands);

- County (Derbyshire, Staffordshire, Cheshire, Merseyside);
- District (town or parish area e.g. the Wirral);
- Local (ecological features that do not meet criteria for valuation at a District or higher level, but that have sufficient value to merit retention or mitigation); and
- Negligible (common and widespread ecological features of such low priority that they do not require retention or mitigation at the relevant location to otherwise maintain a favourable nature conservation status).

6.7.6 All ecological features of Local value and above, where there is the potential for the project to directly or indirectly impact them, will be taken forward to impact assessment and will be the 'relevant ecological features' for the purposes of ecological impact assessment.

6.7.7 In line with the CIEEM guidelines, the terminology used within the EclA will draw a clear distinction between the terms 'impact' and 'effect'. For the purposes of the EclA, these terms are defined as follows:

- impact – actions resulting in changes to an ecological feature; for example, demolition activities leading to the removal of a building utilised as a bat roost; and
- effect – outcome resulting from an impact, acting upon the conservation status or structure and function of an ecological feature; for example, killing/injury of bats and reducing the availability of breeding habitat because of the loss of a bat roost may lead to an adverse effect on the conservation status of the population concerned.

Significance Criteria

6.7.8 For each ecological feature only those characteristics relevant to understanding the ecological effect and determining the significance are described. The determination of the significance of effects will be made based on the predicted effect on the structure and function, or conservation status, of relevant ecological features, as follows:

- not significant - no effect on structure and function, or conservation status; and
- significant - structure and function, or conservation status is affected.

6.7.9 For significant effects (both adverse and beneficial) this will be qualified with reference to the geographic scale at which the effect is significant (e.g. an adverse effect significant at a national level).

6.7.10 The CIEEM approach described above broadly accords with the EIA methodology described in Chapter 4 of this Scoping Report. However, a matrix approach will not be used to classify effects, as this deviates from CIEEM guidance. To provide consistency of terminology in the final ecological impact assessment with other Chapters of the ES, the findings of the CIEEM assessment will be translated into the classification of effects scale used in other chapters of the ES as outlined in Table 6-9 below.

Table 6-9: Effect Classification Descriptions

Effect Classification	Terminology use in Other ES Chapters	Equivalent CIEEM Assessment
Significant (beneficial)	Major beneficial	Beneficial effect on structure/function or conservation status at regional, national or international level.
	Moderate beneficial	Beneficial effect on structure/function or conservation status at District or County level.
Not significant	Minor beneficial	Beneficial effect on structure/function or conservation status at Site or Local level.
	Negligible	No effect on structure/function or conservation status.
	Minor adverse	Adverse effect on structure/function or conservation status at Site or Local level.
Significant (adverse)	Moderate adverse	Adverse effect on structure/function or conservation status at District or County level.
	Major adverse	Adverse effect on structure/ function or conservation status at regional, National or International level.

- 6.7.11 Any significant adverse effects would be mitigated or compensated for, whilst ecological enhancements may be recommended where appropriate to meet planning policy objectives. Following the implementation of any mitigation and compensation, as appropriate, any residual effects on ecological features will be identified.

Consultation

- 6.7.12 In addition to formal consultation, engagement will be sought with, as necessary, Natural England, biodiversity officers for Peak District National Park Authority, High Peak Council, Staffordshire Moorlands Council, Derbyshire Dales, Cheshire East Council, Cheshire West and Chester Council, Wirral Council, Staffordshire County Council, Derbyshire County Council (as applicable), the EA and other interested parties, such as the RSPB, Forestry Commission, Wildlife Trusts, etc.

Assumptions and limitations

- 6.7.13 This scoping chapter has been written in the absence of detailed desk study information or any field surveys. Therefore, the scope of the assessment will be subject to change as information is obtained.
- 6.7.14 The level of detail regarding design and construction information (e.g. pipeline corridor location, detail on compressor stations, compounds, storage areas, welfare units and duration of works), lighting and drainage may be limited initially and may be subject to change as the project develops. This will be acknowledged in the ES.
- 6.7.15 Ecological surveys are limited by factors which affect the presence of plants and animals such as the time of year, migration patterns and behaviour. Therefore, the absence of evidence of any specific species should not be taken as conclusive proof that the species is not present or that it will not be present in the future. However, professional judgement allows for the likely presence of these species to be predicted with enough certainty to not significantly limit the validity of findings.

Summary of issues to be scoped in / out

- 6.7.16 A summary of the issues to be scoped in or out of the biodiversity assessment is presented in Table 6-10 to Table 6-12 below.

Table 6-10: Biodiversity Scope – Capture Facilities

Biodiversity Scope – Capture Facilities				
Scope Scoped in ✓, scoped out ✗	Construction (C), Operation (O), Decommissioning (D)			Rationale
	C	O	D	
Designated Sites – non-statutory and statutory	✓	✓	✓	The Scoping Boundary is within close proximity to several designated sites. Land within the ZoI of the Scoping Boundary has the potential to support protected/notable habitats and species. At this stage it is not possible to scope out the majority of ecological features due to the limited desk study, absence of field surveys and limited information available relating to design, construction, operation or decommissioning. The Capture Facilities do not interact with the marine environment therefore marine ecology is scoped out
Habitats (of botanical interest)	✓	✓	✓	
Hedgerows	✓	✓	✓	
Breeding Birds	✓	✓	✓	
Wintering Birds	✓	✓	✓	
GCN	✓	✓	✓	
Bats	✓	✓	✓	
Badger	✓	✓	✓	
Otter and Water Vole	✓	✓	✓	
Reptiles	✓	✓	✓	
Terrestrial Invertebrates	✓	✓	✓	
Aquatic Ecology	✓	✓	✓	
Marine Ecology	✗	✗	✗	

Table 6-11: Biodiversity Scope – Peak Cluster Pipeline

Biodiversity Scope – Peak Cluster Pipeline				
Scope Scoped in ✓, scoped out ✗	Construction (C), Operation (O), Decommissioning (D)			Rationale
	C	O	D	
Designated Sites – non-statutory and statutory	✓	✓	✓	The Scoping Boundary is within close proximity to several designated sites. Land within the zone of influence of the Scoping Boundary has the potential to support protected/notable habitats and species. At this stage it is not possible to scope out the majority of ecological features due to the limited desk study, absence of field surveys and limited information available relating to design, construction, operation or decommissioning. The pipeline to the Coastal AGI does not interact with the marine environment therefore marine ecology is scoped out.
Habitats (of botanical interest)	✓	✓	✓	
Hedgerows	✓	✓	✓	
Breeding Birds	✓	✓	✓	
Wintering Birds	✓	✓	✓	
GCN	✓	✓	✓	
Bats	✓	✓	✓	
Badger	✓	✓	✓	
Otter and Water Vole	✓	✓	✓	
Reptiles	✓	✓	✓	
Terrestrial Invertebrates	✓	✓	✓	
Aquatic Ecology	✓	✓	✓	
Marine Ecology	✗	✗	✗	

Table 6-12: Biodiversity Scope – Coastal AGI to MLWS Pipeline(s)

Biodiversity Scope – Coastal AGI to MLWS Pipeline				
Scope Scoped in ✓, scoped out ✗	Construction (C), Operation (O), Decommissioning (D)			Rationale
	C	O	D	
Designated Sites – non-statutory and statutory	✓	✓	✓	The Scoping Boundary is within close proximity to several designated sites. Land within the zone of influence of the Scoping Boundary has the potential to support protected/notable habitats and species. At this stage it is not possible to scope out the majority of ecological features due to the limited desk study, absence of field surveys and limited information available relating to design, construction, operation or decommission. Marine Ecology is discussed in more detail in Chapter 12.
Habitats (of botanical interest)	✓	✓	✓	
Hedgerows	✓	✓	✓	
Breeding Birds	✓	✓	✓	
Wintering Birds	✓	✓	✓	
GCN	✓	✓	✓	
Bats	✓	✓	✓	
Badger	✓	✓	✓	
Otter and Water Vole	✓	✓	✓	
Reptiles	✓	✓	✓	
Terrestrial Invertebrates	✓	✓	✓	
Aquatic Ecology	✓	✓	✓	
Marine Ecology	✓	✓	✓	

6.8 Planned Surveys

- 6.8.1 The surveys proposed below are based on assumptions relative to the current Scoping Boundary. However, as the design of the project evolves, it is expected that the draft order limits will be established, focussed largely on a 100 m wide corridor. Therefore, the location of surveys proposed in this are subject to be refined where there are future design amendments and the route corridor is finalised.
- 6.8.2 As noted above, habitats within the Scoping Boundary will be confirmed by undertaking a UK Habitat (UKHab) Classification survey (Ref 6-5) at the earliest appropriate opportunity. In advance of this, to assist with scoping and survey planning, open-source habitat datasets will be obtained and used to formulate a habitat baseline in GIS for the land within the Scoping Boundary and a 250 m buffer. The baseline will draw on Living England and the Priority Habitats Inventory, supplemented with EA river datasets, to map habitats and watercourses. Workflows will be set up to translate the open-source data into UKHab Classification. Where possible, existing habitat survey data held by the project or other stakeholders, will be used to add further detail to the open-source data.
- 6.8.3 Habitat surveys will subsequently be focussed where the permanent capture facilities and AGIs may be located, along the proposed pipeline route, and temporary construction areas, and will also include habitat condition assessments, undertaken with reference to UKHab classifications to inform the BNG assessment (refer to Section 6.7 below for further information). Habitat condition assessment surveys of habitats of additional potential interest will also be conducted within the appropriate seasonal period to ensure the criteria for habitat condition can be effectively determined.
- 6.8.4 The initial desk-based habitat mapping will be used to target botanical surveys to the habitats where they will be most valuable and subject to stakeholder approval, may be used to determine habitats where detailed botanical surveys will not be proposed, e.g. pasture (modified grassland) and cropland.
- 6.8.5 The Proposed Development is close to several statutory sites that are designated for their internationally and nationally important passage and wintering bird populations. Due to the potential for adverse impacts on these bird populations e.g. through disturbance or habitat loss surveys for passage and wintering birds commenced in October 2025. As land access arrangements are not yet agreed, these surveys are being undertaken from Public Rights of Way (PRoW) only and include:
- High and Low Tide WeBS counts - Monthly high and low tide wetland bird surveys will be performed along the foreshore in Hoylake where the scheme makes landfall between October 2025 and April 2026, inclusive. A transect that runs for 1 km beyond the Scoping Boundary will be walked during the two-hour window either side of high or low tide. Each month the transect will be walked in the opposite direction to reduce any bias due to the height of the tide. During the survey all waterbird (divers, grebes, cormorants, herons, swans, geese, ducks, rails, cranes, waders, gulls, terns and kingfishers) species and raptors will be recorded. The number and approximate distribution of waterbirds will be recorded onto a map.
 - Functionally Linked Land Surveys - Monthly high and low tide functionally linked land walkover surveys will be performed along the length of the Wirral peninsula from where the scheme makes landfall south to the M56. This area has been scoped in due to its proximity to the Dee

Estuary, Mersey Narrows and North Wirral Foreshore and Mersey Estuary SPAs, and the results of a Natural England study to identify functionally linked land in north-west England that identified the land as suitable foraging habitat for SPA birds. Surveys will be conducted between October 2025 and April 2026 inclusive. Transects that cover the Scoping Boundary and a 500 m buffer, will be walked during the two-hour window either side of high or low tide. Vantage point locations will be positioned along the route of the transect from which fields will be scanned for birds. Each month the transect will be walked in the opposite direction to reduce any bias due to the height of the tide. During the survey all waterbird species and raptors will be recorded. The number and approximate distribution of waterbirds will be recorded onto a map.

- Sandbach Flashes SSSI WeBS counts - Monthly survey visits between October 2025 and April 2026 will be performed on waterbodies and land parcels that form part of the Sandbach Flashes SSSI within the Scoping Boundary and a 500 m buffer. Vantage points that allow the whole of the waterbodies to be surveyed will be selected. During the survey all waterbird species and raptors will be recorded. The number and approximate distribution of waterbirds will be recorded onto a map.
- River Gowy Valley winter walkover surveys - Monthly survey visits between November 2025 and February 2026 will be performed in the River Gowy valley near Hargrave, Cheshire as it passes through improved grassland fields in its floodplain. Surveys are scoped in as the habitats have potential to be functionally linked land for foraging golden plover and lapwing which are both designated bird features of the Mersey Estuary SPA which is 10-15 km north. Daytime walkover surveys will be performed, in which a transect will be walked. During the transect the surveyors will stop and scan fields where appropriate. All waterbird species and raptors will be recorded. The number and approximate distribution of waterbirds will be recorded onto a map.
- Nocturnal Surveys - Monthly high and low tide nocturnal surveys will be performed in the fields around the proposed compressor station locations at Hoylake. Surveys will be conducted between October 2025 and April 2026 inclusive. Transects that cover the proposed compressor station locations and a 500 m buffer, will be walked during the two-hour window either side of high or low tide. Vantage point locations will be positioned along the route of the transect from which fields will be scanned for birds. Each month the transect will be walked in the opposite direction to reduce any bias due to the height of the tide. During the survey all waterbird species and raptors will be recorded. The number and approximate distribution of waterbirds will be recorded onto a map.

6.8.6 Breeding bird surveys will also be undertaken and will include the surveys outlined below.

- The Peak District Moors SPA at the eastern extent of the Scoping Boundary is designated for its breeding golden plover population. The pipeline route passes through habitat which golden plover may breed on and that may be functionally linked to the SPA. Additionally, Natural England have highlighted the south-western part of the Peak District as an important area for ground nesting bird species such as curlew, lapwing and snipe. As such, moorland breeding bird surveys are required to identify breeding waders in this area of the Peak District.
- Sandbach Flashes SSSI is also designated for its important breeding bird assemblage. Breeding bird surveys are required at Sandbach Flashes to record the breeding assemblage present and to develop mitigation strategies for the construction phase of the project.

- Additional breeding bird surveys will be undertaken in locations which support habitats (river valleys, ancient woodland and large waterbodies) which can be important to rare breeding birds, e.g. wood warbler, lesser spotted woodpecker *Dendrocopos minor*, grasshopper warbler *Locustella naevia*, cuckoo *Cuculus canorus* and Cetti's warbler *Cettia cetti*.
- Schedule 1 of the WCA makes it illegal for any person to intentionally or recklessly disturb any wild bird included in Schedule 1 while it is building a nest or is in, on or near a nest containing eggs or young; or disturb dependent young of such a bird. Species included on Schedule 1 include barn owl, hobby *Falco subbuteo*, kingfisher, red kite *Milvus milvus* and peregrine *Falco peregrinus*. As such, species specific surveys for these species will be undertaken to identify locations they are breeding and to develop mitigation strategies for the construction phase of the Proposed Development.

- 6.8.7 A key objective of the ornithological surveys is to determine the extent that terrestrial habitats are used by species for which designated sites are notified. The results of the surveys will be used to inform the Habitats Regulations Assessment (refer to Section 6.8 below) and the broader EclA, such that potential adverse effects of temporary habitat loss, displacement and disturbance of birds, arising from noise and visual impacts during construction of the Proposed Development, can be quantified and assessed.
- 6.8.8 It is anticipated that some habitats within the Scoping Boundary will have suitability to support protected/notable species including plants, bats, amphibians including great crested newt, badger, otter, water vole *Arvicola amphibius*, reptiles, fish and invertebrates. The scope of the planned (and ongoing) ecology surveys is set out in Table 6-13.
- 6.8.9 The survey methodologies will follow Natural England standing advice and CIEEM best practice guidance for protected species and habitats.

Table 6-13: Scope of Proposed Development's Biodiversity Surveys

Survey	Scope of Survey	Survey Timing - Months	Survey Area Extent	Justification
Habitats: UKHab Survey and condition assessments	UKHab and condition assessment in accordance with Defra's Statutory Biodiversity Metric. Assessment of possible presence of protected, priority or otherwise notable species and, where relevant, the likely importance of habitat features for such species. Record of INNS of plants. Incidental records of protected or priority species or their field signs. National Vegetation Classification (NVC), PSYM and Ditch surveys as required.	Optimal time – April to October 2026 Additional surveys in 2027 if required.	Scoping Boundary	The information will form the basis of the calculation of potential permanent (albeit minor) and temporary habitat effects within the EclA. Habitat condition assessments are required to support a BNG assessment for the Proposed Development.
Hedgerows	Hedgerows that are identified as potentially important and crossed by the Proposed Development will be surveyed in accordance with the methodology as outlined in DEFRA (2007) Hedgerow Survey Handbook: A standard procedure for local surveys in the UK (Ref 6-6).	Optimal time – May to September 2026 inclusive. Surveys, where required, will be carried out May/July 2026. Additional surveys in 2027 if required.	Scoping Boundary	Dedicated hedgerow surveys considered to only be warranted where potentially important hedgerows are directly impacted by the Proposed Development. The information collated will also be used to inform the condition and distinctiveness assessment within the BNG calculation.
Breeding birds	Surveys using a "look-see" method to count birds and record their behaviours, using BTO species codes and behaviour notations, from walked and driven transects and ad hoc vantage points (Section 6.5.1.5).	Late March and mid-July 2026 inclusive. Additional surveys in 2027 if required.	Scoping Boundary plus 100 m buffer.	Survey scope suitable to address the potential temporary indirect effects of the Proposed Development and the minor permanent habitats losses predicted.

Survey	Scope of Survey	Survey Timing - Months	Survey Area Extent	Justification
Wintering and passage birds	Refer to Section 6.5.1.4 above.	October 2025 – April 2026. (Winter 2026-2027 to supplement as necessary).	Scoping Boundary plus up to 1 km.	Will provide sufficient baseline information on wintering and passage bird assemblages to enable robust assessment of potential temporary indirect effects of the Proposed Development and the minor permanent habitats losses predicted, in combination with third party data.
Great Crested Newt ¹	Habitat Suitability Index (HSI) of ponds in accordance with Oldham et al., 2000 (Ref 6-7) and as modified by ARG UK, 2010 (Ref 6-8). A desk-based exercise will also be undertaken to map and categorise all waterbodies scoped in for survey. The exercise will be based upon data collected by the desk study and online information where this may be available i.e., European protected species mitigation licence information and Natural England Open data sources to inform the likely distribution of this species close to the Proposed Development extents.	May be carried out at any time of year but will be undertaken between March/April 2026 and September 2026. Can be undertaken at the same time as eDNA survey. Additional surveys in 2027 if required.	Number of ponds and location to be confirmed following the desk study and confirmation of proposed survey and licensing route.	Used to inform subsequent presence/absence surveys. Extent of survey area will ensure flexibility to allow for minor changes in route.
	Presence/ absence survey. Where possible environmental DNA (eDNA) surveys (using approved great crested newt eDNA kit suppliers), will be undertaken in accordance with the protocols as set out by Biggs et al. (Ref 6-9).	eDNA: April to June (2026) Traditional presence/absence surveys:	One survey visit to each pond Number of ponds and	Based upon the avoidance of loss or direct effects upon great crested newt breeding waterbodies and prominently temporary nature of the proposed pipeline route construction works it is proposed that there is an appropriately robust and precededented approach to mitigation and legal

¹ Proposed survey and licensing route for great crested newt will need to be confirmed through consultation with stakeholders in relation to District Level Licensing (DLL) or traditional EPS mitigation licensing. Detailed survey proposals may subsequently be developed.

Survey	Scope of Survey	Survey Timing - Months	Survey Area Extent	Justification
	Where eDNA methodology may not be possible at specific waterbodies (e.g., likely contamination present or water too shallow for sampling) consideration of the need to undertake traditional presence/absence survey techniques will be made. Where necessary, standard presence/ absence surveys utilising four visits will be undertaken in accordance with the standard survey methodology (Ref 6-10).	Mid-March to mid-June (2026) These surveys may need to be commenced prior to receipt of eDNA survey results to achieve required timings. Additional surveys in 2027 if required.	location to be confirmed following the HSI and eDNA survey.	compliance based on presence/ absence baseline data only. This data will be sufficient to support an application under a District Level Licensing (DLL) Scheme or a traditional EPS mitigation licence.
	Population size class assessment survey. Six survey visits of waterbodies with positive eDNA result or known to support GCN (from desk-based data) in accordance with standard guidance (Ref 6-10).	Mid-March to mid-June 2026. Additional surveys in 2027 if required.	Number of ponds and location to be confirmed following the HSI and eDNA survey.	Where permanent GCN habitat losses are predicted, it is proposed that population information may be required to support the assessment of effects and the determination of the requirements for mitigation to be adopted under a traditional EPSM GCN licence approach (were a DLL option not available) and licensable activities could not be entirely avoided.
Bats - Preliminary Roost Features (PRF) assessment	Permanent impacts on trees will be avoided where possible. Trees to be directly impacted will be subject to a Ground Level Tree Assessment (GLTA) survey in accordance with The Bat Conservation Trust guidance (Ref 6-11). No structures or buildings are proposed to be directly affected by the Proposed	May be undertaken any time of year – proposed March to September 2026. Additional surveys in 2027 if required.	Scoping Boundary	Information collated on the location of trees that are suitable for roosting bats will inform design and offset buffers to avoid direct effects upon potential roost sites (and avoidance of trees and woodland with higher ecological value irrespective of bats which should be avoided). Furthermore, the PRF assessment information will form the

Survey	Scope of Survey	Survey Timing - Months	Survey Area Extent	Justification
	Development. Should a structure or building be impacted this will also be subject to PRF assessment in accordance with current guidance (Ref 6-11).			basis of the scope for further surveys (as detailed below).
Bats – Foraging/ Commuting	Activity surveys will be undertaken based upon published guidance (Ref 6-11) predominantly where permanent habitat effects are predicted e.g. AGIs, Compressor Sites, etc. An appropriate level of survey effort comprising walked transects and periods of remote static detector deployment across the activity season will be undertaken based on the suitability of the habitats for foraging/ commuting bats. This will be undertaken in accordance with standard survey guidance and commensurate with the likely effects on foraging and commuting habitat and the value of existing habitat to bats. Activity transect routes will be planned to provide representative coverage of all habitats of potential value to foraging/ commuting bats, mainly within proximity to the areas of permanent land take (although the requirements for this will be reviewed dependent on the suitability of the habitat for bats and the likely effects.)	May to September 2026. Additional surveys in 2027 if required.	Limited to areas of suitable habitat which will be permanently lost to facilitate the development.	It is not considered that detailed bat activity surveys will be necessary along the entirety of the pipeline route given the temporary nature of habitat loss, and the aim to avoid mature trees or other structures which may support roosting bats, where possible. Where linear habitat features e.g. watercourses/ hedgerows are affected by the Proposed Development, but which may provide commuting routes or a foraging resource for bats, appropriate robust and precedented mitigation measures may be secured via adoption of construction methods that seek to reduce the temporary effects to a level that would not be significant. This may include use of Temporary Flightlines (TFLs) during construction and to provide continuity in the short to medium term while permanent plants mature. TFLs may comprise a line of potted shrubs/trees, screening, and/or temporary fencing (Ref 6-12). Surveys will be targeted to where it is identified that significant effects may occur, e.g. potential for a significant foraging or commuting

Survey	Scope of Survey	Survey Timing - Months	Survey Area Extent	Justification
				location linked to a large roost, habitats which may not be easily/quickly restored and requires further assessment and consideration in relation to mitigation design.
Bats - Roosting	The Proposed Development will aim to avoid trees with PRFs. However, where this is not possible, trees will be subject to climbing and assessment of the identified PRF features where safe to do so, to confirm if the tree could be used as a roost and/ or if there are signs of bats. Where tree climbing confirms that the PRF does have potential to support a roost and /or where it is not possible to safely climb a tree, bat emergence surveys with Night Vision Aids (NVA) will be undertaken in accordance with standard survey guidance (Ref 6-11).	May to September 2026. Additional surveys in 2027 if required.	Scoping Boundary	To determine appropriate mitigation, and EPSM licensing requirements if necessary, where trees with confirmed/ potential bat roosts cannot be entirely avoided.
Bats – Hibernation	The chosen alignment of the pipeline will aim to avoid PRFs suitable for hibernation. If this is not possible, surveys in winter 2026/2027 will be undertaken in order to determine mitigation and licensing requirements. This will include roost inspections and use of static detectors, as required.	November 2026 to February 2027. Additional surveys in 2027 if required.	Scoping Boundary	To determine appropriate mitigation, and EPSM licensing requirements if necessary, where trees with confirmed/ potential hibernation roosts cannot be entirely avoided.
Badger	Presence/absence survey for setts and field signs. The survey will focus on habitat suitable to support setts. Incidental records obtained	Any time of year – undertaken with UKHab survey where	Scoping Boundary plus 30 m.	To determine appropriate mitigation either through avoidance of impacts on setts, or Natural England licensing for sett closures

Survey	Scope of Survey	Survey Timing - Months	Survey Area Extent	Justification
	through desk study data in combination with the completion of other surveys will also supplement the baseline assessment.	possible (April to October 2026). Additional surveys in 2027 if required.		where direct impacts cannot be avoided. Pre-construction surveys for badger in areas where records of badger activity are identified will be committed to via the EclA and embedded with mechanisms such as the CEMP or equivalent.
Otter	Presence/absence survey looking for field signs along watercourses and ditches where open cut crossing techniques will be required.	Any time of year – undertaken with water vole or aquatic surveys where possible (April to September 2026). Additional surveys in 2027 if required.	Up to 500 m length of the watercourse – 250 m up and downstream of crossing point. Access will be required to both banks and up to 10 m from the bank edge.	To determine appropriate mitigation either through avoidance of impacts on otter habitat, or Natural England licensing where direct impacts cannot be avoided.
Water vole	Presence/absence survey based on Strachan et al. (Ref 6-13); a spring survey will be completed, and a second autumn period survey as required to confirm presence/ likely absence.	One visit mid-April to end of June; second visit July to September 2026. Additional surveys in 2027 if required.	All suitable watercourses within Scoping Boundary plus 10 m.	To determine appropriate mitigation either through avoidance of impacts on water vole habitat or Natural England licensing where direct impacts cannot be avoided.
Reptiles	A desk-based habitat assessment (using aerial mapping and data sources for reptile records/mapping for the area/county) will be undertaken to highlight potential areas of	If required: Optimal – April to middle of June and September 2026.	Limited - Only likely required at potential permanent	Presence/ absence reptile surveys will only be completed where areas of moderate/ high value reptile habitat could not be avoided by the Project. This data will

Survey	Scope of Survey	Survey Timing - Months	Survey Area Extent	Justification
	interest for reptiles within the Scoping Boundary. These areas will then be subject to assessment for their potential to support reptiles based on technical guidance by ARC Trust (Ref 6-14). Where habitats appear suitable for reptile populations and are to be permanently affected by the Proposed Development, presence/absence surveys will be undertaken following guidance provided in Froglife Advice Sheet 10: Reptile Surveys (Ref 6-15).	Additional surveys in 2027 if required.	infrastructure locations.	inform the EcIA and mitigation strategy. Temporary construction effects upon small areas of suitable reptile habitat will be able to be mitigated through appropriate pre-construction measures where habitats/features of interest for reptiles are identified e.g. supervised vegetation clearance at an appropriate time of year. Further details would be provided in an Outline CEMP.
Terrestrial Invertebrates	A desk based and aerial mapping exercise will review the presence of habitats which may be of particular interest to this species group.	March to August 2026. Additional surveys in 2027 if required.	Scoping Boundary – areas of permanent habitat loss.	To determine appropriate mitigation either through avoidance of impacts or mitigation/compensation through the EcIA.
Aquatic Ecology	A fish habitat assessment and habitat condition assessment (Modular River Physical) survey (Ref 6-16) of watercourses crossed by the Proposed Development will be undertaken. Subsequent surveys for macrophytes, invertebrates and fish will be undertaken where necessary.	March to September 2026. Additional surveys in 2027 if required.	Focused on watercourse crossing points. Minimum survey length 500 m.	Habitat condition assessments will be undertaken to inform BNG calculations. Fish habitat assessments will also be undertaken in order to determine further survey and mitigation requirements. Impacts on drains/ditches crossed by open-cut techniques will largely be temporary and reversible. The majority of potential impacts (e.g., increase in suspended sediment) will be adequately addressed through standard mitigation techniques to be committed to in the CEMP.

6.9 Mitigation

- 6.9.1 This section describes the typical measures that will be considered to mitigate for any potential adverse ecological effects that could arise from the Proposed Development. Four common forms of mitigation are recognised as follows and will be taken into consideration in the EclA:
- **Avoidance** – Avoidance and prevention of adverse effects through the design of the Proposed Development and sensitive programming of works, for example re-aligning the pipeline to retain important ecological features;
 - **Reduction** – Mitigation to reduce the scale and severity of effects, for example the use of wildlife proof fencing or restricting construction access in areas of ecological interest;
 - **Compensation/replacement/restoration** – Compensation to offset adverse ecological effects through habitat creation, for example provision of bat boxes / houses to replace bat roosts lost by the proposed scheme or replanting hedgerows/reseeding grassland; and
 - **Enhancement** – Enhancement and improvement of existing conditions, for example plant species chosen to enhance diversity and ecological interest of the area.
- 6.9.2 The mitigation measures cannot be detailed in full until the baseline is completed, and the impact assessment concluded. However, initial concepts are outlined below:
- Careful design (e.g. careful lighting design at AGIs to ensure minimal incidental illumination of unnecessary areas);
 - Requirement for a CEMP which would ensure controls on polluting activities and dust generating activities. Outline CEMPs would be submitted as part of the DCO Application;
 - Controls on noise generation and propagation where necessary;
 - Implementation of EPSM licences where necessary, including translocation of great crested newt (for example) and creation of alternative habitat features (e.g. bat roosts), if required;
 - Restoration of specific areas of vegetation clearance to improved habitat quality; and
 - If necessary, provision of compensatory replacement habitat.
- 6.9.3 This is a preliminary list of measures and is not intended to be definitive or comprehensive.

6.10 Habitats Regulations Assessment

- 6.10.1 It is necessary to consider whether the Proposed Development is likely to have a significant effect on areas that have been designated for their international nature conservation value. Known as European Sites, these include SACs, SPAs and, as a matter of government policy, Ramsar sites.
- 6.10.2 European Sites are protected under the Conservation of Habitats and Species Regulations 2017 (relevant to England and Wales) (Ref 6-16). The UK left the EU on 31 January 2020 under the terms set out in the European Union (Withdrawal Agreement) Act 2020 (“the Withdrawal Act”). However, the most recent amendments to the Habitats Regulations – the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 – make it clear that the need for HRA continues to apply.
- 6.10.3 The Scoping Boundary is located within 15 km of the following international sites:
- Peak District Moors SPA;

- South Pennine Moors SAC;
- Peak District Dales SAC;
- Liverpool Bay SPA;
- Mersey Narrows & North Wirral Foreshore SPA/Ramsar;
- Dee Estuary SAC
- Dee Estuary SPA/Ramsar;
- River Dee and Bala Lake SAC;
- Midland Meres & Mosses - Phase 1 Ramsar;
- Midland Meres & Mosses - Phase 2 Ramsar;
- West Midlands Mosses SAC;
- Sefton Coast SAC;
- Mersey Estuary SPA/Ramsar;
- Oak Mere SAC;
- Ribble and Alt Estuaries SPA/Ramsar; and
- Rostherne Mere Ramsar.

- 6.10.4 Stage 1 of the HRA process (Test of Likely Significant Effects) will consider the potential pathways of effect between the Proposed Development and the European designated sites within 15 km of the Scoping Boundary (on the basis that it is unlikely that a Proposed Development such as this will affect sites further afield), and whether there is potential to have a significant adverse effect on the integrity of the European designated sites, either alone or in combination with other plans or projects. Potential pathways of effect currently include noise, light and visual disturbance during construction, pollution (in relation to air quality impacts and via hydrological links to the designated sites) and dust emissions and loss / disturbance of functionally linked land used by qualifying bird species. Information used to support the HRA process will include desk study data and the suite of bird surveys outlined in Table 6-13.
- 6.10.5 Where there is potential for the Proposed Development to have a likely significant effect upon the qualifying features of the European designated sites, the pathway will be taken forward to Stage 2 - Appropriate Assessment. At Appropriate Assessment, the measures that will be implemented to either avoid the impact in the first place, or to mitigate the ecological effect to such an extent that it is no longer significant, will be set out.
- 6.10.6 The HRA will be prepared in line with Planning Inspectorate Advice (Habitats Regulations Assessment) (Ref 6-17) and Planning Inspectorate advice published to gov.uk (Ref 6-18). The HRA process will be in line with the EIA process. There will be a “Test of Likely Significant Effects Report” at the PEIR stage, and this will be updated as necessary for DCO application, and form part of a report to inform Appropriate Assessment, if required.

6.11 Biodiversity Net Gain

- 6.11.1 The Environment Act 2021 (Ref 6-1) supports the Government’s overarching vision for leaving the environment in a better state for the next generation, including transposing elements of the UK

Government's 25 Year Environment Plan (Ref 19) into statute and confirming the UK's approach to environmental governance post-Brexit.

- 6.11.2 Schedule 15 of the Environment Act (2021) makes provision for BNG in relation to development consent for nationally significant infrastructure projects. The requirement for BNG for NSIPs is likely to become mandatory by May 2026. A BNG assessment demonstrating how the 10% gain will be delivered by the Proposed Development will be undertaken in accordance with the published Natural England Statutory Biodiversity Metric 4.0 (Ref 6-2).

6.12 Summary

- 6.12.1 A programme of ecological surveys, including UKHab surveys and protected species surveys, will be undertaken to inform the EclA (surveys for passage/ wintering birds are ongoing, having commenced in October 2025).
- 6.12.2 A summary of the scope of the ecology and biodiversity assessment is provided in Table 6-10 to Table 6-12.
- 6.12.3 As there is potential for significant effects on ecological features this topic is scoped into the main ES, and the assessment will be supported by the survey results presented in technical appendices to the ES chapter.
- 6.12.4 The ecology chapter will also be supported by a BNG assessment with the purpose of meeting the anticipated statutory requirement and emerging planning policy. In addition, a report to inform HRA will be undertaken.

6.13 References

- Ref 6-1** UK Government (2021). Environment Act 2021. Available at: <https://www.legislation.gov.uk/ukpga/2021/30/contents>
- Ref 6-2** Department for Environment, Food and Rural Affairs (DEFRA) (2025). Statutory biodiversity metric tools and guides. Available at: <https://www.gov.uk/government/publications/statutory-biodiversitymetric-tools-and-guides>
- Ref 6-3** CIEEM (2019). Advice Note on the Lifespan of Ecological Reports and Surveys. Available at: <https://cieem.net/wp-content/uploads/2019/04/Advice-Note.pdf>
- Ref 6-4** Chartered Institute of Ecology and Environmental Management (CIEEM) (2024). GUIDELINES FOR ECOLOGICAL IMPACT ASSESSMENT IN THE UK AND IRELAND. Available at: <https://cieem.net/wp-content/uploads/2018/08/EclA-Guidelines-v1.3-Sept-2024.pdf>
- Ref 6-5** UKHab Ltd (2023). UK Habitat Classification Version 2.0. Available at: <http://ukhab.org>
- Ref 6-6** DEFRA (2007). Hedgerow Survey Handbook. Available at: https://assets.publishing.service.gov.uk/media/6863a03d08bf2f5376121a64/hedgerow-survey-handbook_corrected_01.07.25_.pdf
- Ref 6-7** Oldham R.S., Keeble J., Swan M.J.S. & Jeffcote M. (2000). Evaluating the suitability of habitat for the Great Crested Newt (*Triturus cristatus*). Herpetological Journal 10(4), 143-155.

- Ref 6-8** ARG UK (2010). ARG UK Advice Note 5: Great Crested Newt Habitat Suitability Index. Amphibian and Reptile Groups of the United Kingdom.
- Ref 6-9** Jeremy Biggs, Naomi Ewald, Alice Valentini, Coline Gaboriaud, Tony Dejean, Richard A. Griffiths, Jim Foster, John W. Wilkinson, Andy Arnell, Peter Brotherton, Penny Williams, Francesca Dunn (2015). Using eDNA to develop a national citizen science-based monitoring programme for the great crested newt (*Triturus cristatus*). Biological Conservation Volume 183, Pages 19-28, ISSN 0006-3207. Available at: <https://doi.org/10.1016/j.biocon.2014.11.029>.
- Ref 6-10** English Nature (2001). Great crested newt mitigation guidelines. English Nature, Peterborough.
- Ref 6-11** Collins, J. (ed.) (2023). Bat Surveys for Professional Ecologists: Good Practice Guidelines (4th edition). The Bat Conservation Trust, London. ISBN-978-1-7395126-0-6
- Ref 6-12** Strachan, R., Moorhouse, T. and Gelling, M. (2011). Water Vole Conservation Handbook. Third Edition. Wildlife Conservation Research Unit, Oxford.
- Ref 6-13** Edgar, P., Foster, J. and Baker, J. (2020) Reptile Habitat and Management Handbook. Amphibian and Reptile Conservation, Bournemouth.
- Ref 6-14** Froglife (1999). Froglife Advice Sheet 10 – Reptile Survey. Available at: https://www.wildcare.co.uk/media/wysiwyg/pdfs/froglife_advice_sheet_10_-_reptile_surveys.pdf
- Ref 6-15** Cartographer. Available at: <https://app.cartographer.io/>
- Ref 6-16** UK Government (2017). The Conservation of Habitats and Species Regulations 2017. UK Statutory Instruments 2017 No. 1012. Available at: <https://www.legislation.gov.uk/uksi/2017/1012/contents>
- Ref 6-17** Infrastructure Planning Commission (IPC) (2011). Advice Note 10: Habitat Regulations Assessment relevant to nationally significant infrastructure projects. Available at: <https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/General/General-Advice-00047-2-Habitat%20Regulation%20Assessment%20-%20Advice%20Note%2010.pdf>
- Ref 6-18** Planning Inspectorate (2025). Nationally Significant Infrastructure Projects: Advice on Habitats Regulations Assessments. Available at: <https://www.gov.uk/guidance/nationally-significant-infrastructure-projects-advice-on-habitats-regulations-assessments>
- Ref 6-19** UK Government (2018). A Green Future: Our 25 Year Plan to Improve the Environment. Available at: <https://assets.publishing.service.gov.uk/media/5ab3a67840f0b65bb584297e/25-year-environment-plan.pdf>

7. Landscape and Visual

7.1 Introduction

- 7.1.1 This chapter of the Scoping Report presents an initial baseline for landscape and visual amenity relevant to the Proposed Development, identifying the need for additional surveys to ensure there is appropriate information to accurately characterise the baseline and setting out the Landscape and Visual Impact Assessment (LVIA) Study Area. In addition, the chapter provides an overview of the assessment methodology to be followed for the for the LVIA and details the potential effects provisionally identified.
- 7.1.2 There are clear differences between landscape effects and visual effects, and the following distinctions have been made:
- **Landscape effects** relate to changes to the landscape as a resource, including physical changes to the fabric or individual elements of the landscape, its aesthetic or perceptual qualities, and landscape character.
 - **Visual effects** relate to changes to existing views of identified visual receptors ('people'), from the loss or addition of features within their view due to the Proposed Development.
- 7.1.3 Landscape effects and visual effects will therefore be assessed and reported separately.
- 7.1.4 This chapter is supported by the following figures (presented within Appendix B):
- Figure 7.1: Site location and LVIA Study Area;
 - Figure 7.2: Landscape Designations;
 - Figure 7.3: National Landscape Character Areas;
 - Figure 7.4a: Capture facilities and Coastal AGI Zone of Theoretical Visibility – bare earth;
 - Figure 7.4b: Breedon Capture facility Zone of Theoretical Visibility – bare earth;
 - Figure 7.4c: Tarmac Capture facility and Buxton Lime Capture facility Zone of Theoretical Visibility – bare earth;
 - Figure 7.4d: Holcim Capture facility Zone of Theoretical Visibility – bare earth;
 - Figure 7.4e: Coastal AGI Zone of Theoretical Visibility – bare earth;
 - Figure 7.5a: Capture facilities and Coastal AGI Zone of Theoretical Visibility – screened;
 - Figure 7.5b: Breedon Capture facility Zone of Theoretical Visibility – screened;
 - Figure 7.5c: Tarmac Capture facility and Buxton Lime Capture facility Zone of Theoretical Visibility – screened;
 - Figure 7.5d: Holcim Capture facility Zone of Theoretical Visibility – screened;
 - Figure 7.5e: Coastal AGI Zone of Theoretical Visibility – screened;
 - Figure 7.6a: Breedon Capture facility - Representative viewpoints;
 - Figure 7.6b: Tarmac Capture facility and Buxton Lime Capture facility - Representative viewpoints;
 - Figure 7.6c: Holcim Capture facility - Representative viewpoints; and

- Figure 7.6d: Coastal AGI - Representative viewpoints;

7.2 Legislation, Policy and Guidance

7.2.1 A brief overview of the policy, legislative and guidance relevant to the landscape and visual assessment have been reviewed and summarised in Table 7-1 to Table 7-4 below.

Table 7-1: Legislation Relevant to Landscape and Visual Amenity

Legislation
The European Landscape Convention (ELC) 2007 as amended by the 2016 Protocol (Ref 7-1) focuses specifically on landscape issues and highlights the importance of integration of landscape into areas of policy, to promote protection, management and planning of all landscapes including the assessment of landscape and analysis of landscape change.
The Environment Act 2021 (Ref 7-2) provides a general protection of the landscape by protecting and enhancing the natural world.
The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (Ref 7-3) sets out the process of environmental impact assessment for associated development in reference to the Planning Act 2008. The Planning Act 2008 and related secondary legislation, establishes the legislative requirements in relation to applications and proposed applications.
The Energy Act 2023 (Ref 7-4) makes provision for carbon dioxide transport and storage and considers environmental protection.
The National Parks and Access to the Countryside Act 1949 (Ref 7-5) provides the legal definition on National Parks, how they are designated and managed with respect to their purposes. The Act makes provision for National Parks and confers powers for preserving and enhancing the natural beauty, wildlife and cultural heritage of the areas. It also promotes opportunities for the understanding and enjoyment of the special qualities of those areas by the public. The Breedon Capture Facility lies within the Peak District National Park (PDNP) with other facilities and the Peak Cluster Pipeline within the setting.
The Countryside and Rights of Way (CROW) Act 2000 (Ref 7-6) sets out the legal basis for the definition of PROW, users of which may be visual receptors of the Proposed Development.
The Planning (Listed Building and Conservation Areas) Act 1990 (Ref 7-7) provides specific protection for buildings and areas of special architectural or historic interest. These features, which contribute to the heritage of an area and an understanding of historic landscape, are often referred to within the definition of Landscape Character Areas (LCA) and Local Landscape Character Areas (LLCA).
The National Parks and Access to the Countryside Act 1949 section 11A (as amended by section 245 (Protected landscapes) of the Levelling-up and Regeneration Act 2023 (Ref 7-8)) sets out the duty of certain bodies and persons in relation to the purposes for which National Parks are designated. This duty, which will apply to the SoS in determining the DCO application, is to 'seek to further' the statutory purposes of Protected Landscapes such as National Parks. This duty also applies to functions

Legislation
undertaken outside of the designation boundary which affect land within the Protected Landscape .
The Wildlife and Countryside Act 1981 (Ref 7-9) provides a general protection of the landscape. This includes the protection of public rights of way, and protects a selection of threatened animals, plants, and their habitats against harm and disturbance.
The Town and Country Planning (Tree Preservation) (England) Regulations 2012 (Ref 7-10) provide powers to local planning authorities to make and administer Tree Preservation Orders, the purpose of which is to protect selected trees and woodlands by prohibiting their cutting down, uprooting, topping, lopping, wilful destruction or wilful damage without prior consent.
The Hedgerow Regulations 1997 (Ref 7-11) provide protection for Important Hedgerows, these being hedgerows that meet certain criteria in respect of their length, location and importance.

Table 7-2: National Planning Policy Relevant to Landscape and Visual

National Planning Policy
The Overarching National Policy Statement for Energy (EN-1) (Ref 7-12) states that Carbon Capture Storage technologies, pipelines and storage infrastructure are considered to be Critical National Priority Infrastructure. It states that whilst outside the scope of the technology specific National Policy Statements (NPS), that NPS alone will have effect. EN-1 sets out the requirements for assessing and mitigating landscape and visual impacts including construction phase effects as well as the effects of the completed facility, and its operation on landscape components, landscape character and views, and visual amenity.
Paragraph 1.6.9 of NPS for Natural Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4) (Ref 7-13) states that the “guidance that follows in this NPS does not have effect for CCS infrastructure, but may contain information that is important and relevant to the Secretary of State’s decision on applications for CCS infrastructure”.
National Planning Policy Framework (NPPF) (2024) (Ref 7-14); emphasises the importance of delivering good design, and in conserving and enhancing the natural environment. The NPPF becomes relevant to the Development Consent Order process where there is no technology specific NPS.
The Carbon capture, usage and storage: a vision to establish a competitive market policy paper (Ref 7-15) sets out the governments vision for the development and deployment of carbon dioxide transport networks. It states that these should be “located in the right place at the right time and sensitive to the needs and aspirations of local communities”.
The Marine Policy Statement (MPS) (Ref 7-16) provides a framework for taking decisions affecting the marine environment, which includes the areas of seascape around the River Mersey and River Dee as well as the Irish Sea. The MPS states that the impact of development on seascape should consider the “existing character and quality, how highly it is valued and its capacity to accommodate change”.
The North West Inshore and North West Offshore Marine Plan (Ref 7-17) sets out the vision and objectives to enhance and protect the marine environment for the area with

National Planning Policy

policy NW-SCP-1 focusing on the impact on the character and visual resource of the seascape and landscape of the area.

Table 7-3: Local Planning Policy Relevant to Landscape and Visual

Local Planning Policy relevant to Landscape and Visual

The Peak District National Park Core Strategy (Ref 7-18) and Development Management Policies (Ref 7-19) form the Local Plan for the PDNP. This sets out the vision, objectives and spatial strategy for the national park, and core policies to guide development and change.

The North East Derbyshire Local Plan 2014-2034 (Ref 7-23) was adopted in November 2021 and covers the area of North East Derbyshire outside the PDNP. It sets out policies relevant to landscape character, good design and the management of development within the countryside and conservation areas.

The Staffordshire Moorlands Adopted Local Plan 2014 – 2033 (Ref 7-24) was adopted in September 2020 and sets out the council's vision and strategy for the district until 2033. The Staffordshire Moorlands Landscape, Local Green Space and Heritage Impact Study (0) reviews the Visual Open Spaces that are designated in the Local Plan.

The Wirral Local Plan 2022 – 2040 (Ref 7-27) was adopted in March 2025 and forms part of the statutory development plan for the area. The Local Plan includes policies for Areas of Special Landscape Value defined as the highest quality and most value in the Borough in the Wirral Local Landscape Designations Review 2020 (Ref 7-28).

The Chester East Local Plan – Local Plan Strategy 2010 – 2030 (Ref 7-29) was adopted in July 2017 and is “is the council's most important tool for shaping development in Cheshire East”. The plan includes policies for Open countryside, trees hedgerows and woodland, and the landscape. Supplementary planning guidance include the Local Landscape Designations Study (0) provides “further information on the special qualities of locally designated landscapes in Cheshire East”. Cheshire East Borough Council are in the process of preparing a new local plan (Ref 7-32).

Part one of the Cheshire West and Chester Local Plan – Strategic Policies (Ref 7-33) was adopted in January 2015 with Part two Local Plan - Land Allocations and Detailed Policies (Ref 7-34) adopted in July 2019. A review of local landscape designations is reported in Local Landscape Designations: Areas of Special County Value in Cheshire West and Chester (Ref 7-35). Cheshire West and Chester Council are in the process of preparing a new local plan (Ref 7-36).

The adopted Local Plan 2016 (Ref 7-37) for High Peak Borough Council contains policies and identifies sites for development or protection. It includes strategic objectives and policies notably including its role in protecting the Peak District character as an area “of exceptionally high value” that shares “many of the characteristics of the neighbouring Peak District National Park”.

The Derbyshire Dales Local Plan was adopted in December 2017 and (Ref 7-38) “sets out the overall vision, objectives, and policies for the future development of the parts of the Derbyshire Dales that lie outside the PDNP”.

Local Planning Policy relevant to Landscape and Visual

The East Staffordshire Local Plan 2012 – 2031 (Ref 7-39) was adopted in October 2015 and reviewed in October 2020. The plan “delivers a planning framework which responds positively to meeting the development needs of the Borough”.

- 7.2.2 Relevant policies of ‘Made’ Neighbourhood Plans within the LVIA Study Area will also be reviewed in the ES.

Table 7-4: Relevant Standards and Guidance

Relevant standards and guidance
An Approach to Landscape Character Assessment (Ref 7-40) informs the methodology for defining and describing the landscape character baseline.
Assessing landscape value outside national designations, Technical Guidance Note 02/21 (2021), Landscape Institute (Ref 7-41) informs the methodology for assessing the value attached to the landscape.
Nationally Significant Infrastructure Projects: Advice on Good Design (Ref 7-42) explains why good design is important and the importance of Environmental Impact Assessment (EIA) for informing and influencing the design process. It also refers to the National Infrastructure Commissions “Design Principles for National Infrastructure”.
Guidelines for Landscape and Visual Impact Assessment, Third Edition (GLVIA3) (Ref 7-43) underpins the methodology for undertaking the LVIA.
Notes and Clarifications on Aspects of the 3 rd Edition Guidelines on Landscape and Visual Impact Assessment (GLVIA), Technical Guidance Note (Ref 7-44) provides updates to the information and approaches defined in GLVIA3 which underpins the methodology for undertaking LVIA.
Infrastructure, Technical Guidance Note 04/20 (Ref 7-45) highlights the role of landscape design and assessment as part of the process for delivering infrastructure projects.
Tranquillity – An overview, Technical Guidance Note 01/17 (Ref 7-46) provides an overview of what is understood by the term ‘tranquillity’ as an environmental indicator with regard to landscape.
Townscape Character Assessment Technical Information Note 05/17 (Ref 7-47) explains the principles and general approach to landscape character assessment for areas of landscape within the built-up area, including the buildings, the relationship between them, the different types of urban open spaces, including green spaces and the relationship between buildings and open spaces.
Visual Representation of Development Proposals, Technical Guidance Note 06/19 (Ref 7-48) informs the process for producing visualisations and photomontages.
Environmental impact assessment (EIA): a handbook for scoping projects - Scoping the environmental Impacts of Carbon Capture, Transport and Storage (Ref 7-49) provides guidance on the “most likely potential environmental impacts of Carbon Capture, Transport and Storage (CCS chain)”. The guidance specifically discusses “Human Environment” factors indicating the impacts upon landscape and visual amenity. The guidance states that the full range of environmental issues should be assessed on a case-by-case basis.

- 7.2.3 Design guidance for Local Planning Authorities within the LVIA Study Area will also be reviewed as part of the assessment and design process.

7.3 Defining the Study Area

- 7.3.1 Broad Study Areas have been identified to support the scoping of likely landscape and visual effects and the definitions of the LVIA Study Area that will be set out in the ES. The geographical extent of these areas depends upon the size and scale of the elements of the Proposed Development, beyond which significant effects are unlikely.
- 7.3.2 The first stage of defining the LVIA Study Area was informed by a detailed desk study, including the preparation of computer-generated Zones of Theoretical Visibility (ZTV). A ZTV is defined in GLVIA3 (Ref 43) as *“a map, usually digitally produced, showing areas of land within which, a development is theoretically visible.”* ZTVs do not indicate how much of the Proposed Development would be visible. The purpose of the ZTV is to:
- Identify the theoretical extents of visibility of the Proposed Development i.e., areas from which it would not be visible and areas from which it could potentially appear in existing views;
 - Assist in the identification of the LVIA Study Area;
 - Identify areas of landscape and visual receptors likely to be affected by the Proposed Development;
 - Identify locations that are representative of the views experienced by visual receptors at different locations within the LVIA Study Area (representative viewpoints); and
 - Inform the design, including the extent and type of proposed mitigation.
- 7.3.3 ZTVs have been modelled using the ‘Viewshed’ tool in ESRI ArcPro GIS software.
- 7.3.4 A bare earth ZTV was prepared using digital terrain model (DTM) data with a resolution of 2 m. This ZTV represents a worst-case scenario as it does not include features such as existing buildings or vegetation which can screen or filter views. It does not include surface features and is based on the current maximum parameters of the proposed Capture Facilities, Peak Cluster Pipeline and associated infrastructure. The results are illustrated in Figure 7.4a Capture Facilities Bare earth Zone of Theoretical Visibility, which shows areas from which the Proposed Development is theoretically visible or not visible. For all ZTVs an assumed viewing height of 1.7 m above ground level has been used to simulate the eye level of a person at the top of the range set out in paragraph 6.11 of GLVIA3 to represent the worst-case scenario.
- 7.3.5 A detailed assessment of the existing landscape components, character and views of the Proposed Development will be carried out to refine the LVIA Study Area further in consideration of the following:
- site context;
 - topography;
 - vegetation including green infrastructure;
 - roads, public rights of way and access;
 - settlement and land-use;
 - landscape character; and

- representative views.

- 7.3.6 The LVIA Study Area may be reduced in places to focus the assessment or extended to include other sensitive receptors as the design of the Proposed Development progresses. Such changes will be made in consultation with relevant local planning authorities and other relevant stakeholders. The justification for its final extent will be set out in the PEIR and ES.
- 7.3.7 The Study Area for the LVIA is set out in Table 7-5 and is illustrated in Figure 7.1 Site Location and LVIA study area.

Table 7-5: LVIA Study Area

Element of the Proposed Development	Study Area
Capture Facilities	10 km
Peak Cluster Pipeline	2 km
Above Ground Installation (AGI) and Block Valve Station (BVS)	2 km
Coastal AGI	10 km
Coastal AGI to Mean Low Water Spring (MLWS) Pipeline(s)	2 km

7.4 Baseline Environment

- 7.4.1 An initial study of the baseline environment has been undertaken through desk-based research and is presented below.
- 7.4.2 The baseline environment section of the LVIA will provide a description of the landscape and visual receptors identified, indicating their sensitivity against which the potential change arising from the Proposed Development will be assessed.
- 7.4.3 Key sources of information for the landscape and visual baseline include:
- Ordnance Survey (OS) mapping, and aerial photography;
 - LiDAR Digital Terrain Model (DTM) mapping;
 - Natural England National Character Area Profiles;
 - National, regional, and local planning policy; and
 - Published landscape character assessments.

Landscape designations

- 7.4.4 Landscape designations and other relevant environmental designations within the LVIA Study Area are shown on Figure 7.2 Landscape relevant designations and recreational routes.
- 7.4.5 The PDNP was designated in 1951 *“because it exhibits a range of special qualities, which are nationally, and frequently internationally significant”* (Ref 7-21). These special qualities are outlined in the PDNP Management Plan 2023-28 (ibid.) and include:
- *“Beautiful views created by contrasting landscapes and dramatic geology;*
 - *Internationally important and locally distinctive wildlife and habitats;*
 - *Undeveloped places of tranquillity and dark night skies within reach of millions;*
 - *Landscapes that tell a story of thousands of years of people, farming and industry;*

- *Characteristic settlements with strong communities and traditions;*
- *An inspiring space for escape, adventure, discovery and quiet reflection; and*
- *Vital benefits for millions of people that flow beyond the landscape boundary”.*

- 7.4.6 The Breedon cement production plant at Hope, where the future Breedon Capture Facility will be located, is within the PDNP. Whilst the Tarmac Capture Facility, Buxton Lime Capture Facility, and Holcim Capture Facility are to be located outside of the PDNP, they are likely to be within its setting.
- 7.4.7 The Peak Cluster Pipeline corridor is located within the PDNP between the Breedon Capture Facility and the proposed North Feeder AGI located approximately 500m to the south of Chapel-En-Le-Frith. The Peak Cluster Pipeline corridor also passes through the PDNP approximately 150 m south of High Lane and Disley. Large sections of the Peak Cluster Pipeline corridor are also located within the setting of the PDNP including the south-eastern leg between the Holcim Capture Facility and the settlement of Ryecroft Gate.
- 7.4.8 The Clwydian Range and Dee Valley National Landscape is located approximately 13.5 km south-west of the Coastal AGI within the Wirral Peninsula. Impacts upon the statutory purpose and special qualities of the National Landscape are considered unlikely due to the considerable intervening distance, and it is therefore proposed to be scoped out of the LVIA presented in the ES.

Local landscape designations

- 7.4.9 Staffordshire Moorlands District council has designated ‘Visual Open Space’ as areas *“where the intention will be to retain the land’s open and undeveloped appearance”* (Ref 7-26) as part of their Local Plan evidence base. This designation relates principally to the openness of the landscape but does also refer to visual amenity and attractiveness and will therefore be considered when defining the value attached to the landscape in the LVIA.
- 7.4.10 Wirral Council have identified Areas of Special Landscape Value (ASLV) as *“the landscapes of the highest quality and most value in the Borough that could potentially merit local designation in line with current best practice”* (Ref 7-28) as part of their Local Plan evidence base.
- 7.4.11 The Cheshire East Local Landscape Designation review (Ref 7-30) reaffirms the local landscape designations within the area (*“Cheshire East’s Valued Landscapes”*) and describes their special qualities as part of their Local Plan evidence base.
- 7.4.12 The Chester West and Chester Borough Council Local Landscape designations: Areas of Special County Value (ASCV) (Ref 7-35) identifies and defines *“the character and special landscape qualities of the eight ASCVs to inform emerging Local Plan (Part Two) criteria-based policy”*.
- 7.4.13 Local landscape designations relevant to the Proposed Development and Study Area are shown in Table 7-6 below.

Table 7-6: Local Landscape Designations

Local landscape designation	LPA jurisdiction	Element of the Proposed Development
39: Central Square, Waterhouses Visual Open Space	Staffordshire Moorlands District council	Holcim Capture Facility; Peak Cluster Pipeline East
Central Wirral Sandstone Hills ASLV;	Wirral Council	Peak Cluster Pipeline West

Local landscape designation	LPA jurisdiction	Element of the Proposed Development
Thornton Hough Estates ASLV		Peak Cluster Pipeline West
2: Bollin Valley and Parklands Valued Landscape	Cheshire East Council	Peak Cluster Pipeline East; Central Feeder AGI
4: Dane Valley Valued Landscape		Peak Cluster Pipeline Central
5: Peak Park Fringe Valued Landscape		Peak Cluster Pipeline East
8: Weaver Valley Valued Landscape		Peak Cluster Pipeline Central
2: Dee Coastal Area ASCV	Chester West and Chester Borough Council	Peak Cluster Pipeline East; Connection AGI 2
6: Weaver Valley ASCV		Peak Cluster Pipeline Central

Other relevant designations

- 7.4.14 Other relevant designations within the LVIA Study Area have the potential to inform landscape value because of their contribution to landscape character and visual amenity. Further detail regarding these designations is provided in Chapter 6: Biodiversity and Chapter 10: Historic Environment.
- 7.4.15 Ecological designations within the Scoping Boundary include Sites of Special Scientific Interest (SSSI) such as Thurstaston Common SSSI, Sandbach Flashes SSSI, and North Wirral Foreshore SSSI; Special Areas of Conservation (SAC) such as the Dee Estuary SAC; and Special Protection Areas (SPA) such as Liverpool Bay SPA. These designations may be important in considering the value attached to the landscape.
- 7.4.16 The Jodrell Bank Observatory received inscription as a UNESCO World Heritage Site in 2019. Along with the listed buildings associated with the Outstanding Universal Value of Jodrell Bank, a buffer zone is protected by the Town and Country Planning (Jodrell Bank Radio Telescope) Direction 1973 and also forms part of the Cheshire East Local Plan (Ref 29). The buffer zone, which extends to over 185km² has *“protected the property from developments (e.g. housing, industrial units etc) which might had impacted adversely on the radio interference environment around it and impaired its science”* (Ref 22).
- 7.4.17 The proposed Peak Cluster Pipeline corridor passes through the Jodrell Bank Observatory Buffer Zone with the Holmes Chapel AGI Study Area also falling within it.
- 7.4.18 There are numerous Registered Parks and Gardens within the LVIA Study Area. ‘The Slopes’ at Buxton (grade II) are located approximately 3.3 km west of the Tarmac Capture Facility and Buxton Lime Capture Facility.
- 7.4.19 The proposed Peak Cluster Pipeline corridor passes through the grade II* listed Lyme Park. The grade II* listed Gawsworth [old] Hall is located along the Scoping Boundary.
- 7.4.20 The grade I listed Birkenhead Park and grade II* listed Flaybrick memorial gardens are located approximately 3.7 km and 4.8 km respectively to the south-east of the nearest proposed Coastal AGI site.
- 7.4.21 The following Registered Parks and Gardens are located within the LVIA Study Area for the Proposed Development:

- Adlington Hall (grade II*) approximately 1.3 km west;
- Mellor's gardens (grade II) approximately 2.6 km south;
- West Park (grade II) approximately 2.8 km east;
- Biddulph Grange (grade I) approximately 1.3 km south;
- Congleton Park (grade II) approximately 2.4 km east;
- Burton Manor (grade II) approximately 2.4 km south-west;
- Ness botanic gardens (grade II) approximately 2.6 km west; and
- The grounds of Thornton manor (grade II*) approximately 120 m west.

Landscape character

- 7.4.22 GLVIA3 defines landscape receptors as *"aspects of the landscape resource that have the potential to be affected by a proposal"* (Ref 7-43). Landscape receptors have been identified via a review of published landscape character assessments, maps and aerial photography, relevant planning policy and fieldwork surveys.
- 7.4.23 Landscape character is defined by GLVIA3 as *"a distinct, recognisable and consistent pattern of elements in the landscape that makes one landscape different from another, rather than better or worse."*
- 7.4.24 Published landscape character assessments at the national, regional and local level have been reviewed to identify Landscape Character Types (LCT) and Landscape Character Areas (LCA). National LCA are mapped in Figure 7.3 National Landscape Character Areas.
- 7.4.25 LCAs are discrete occurrences of LCTs which can occur in more than one place. Therefore, the LVIA will focus on LCAs defined in published landscape character assessments to assess the likely impacts and effects on the landscape resource. Where there are gaps in published information, Local LCAs (LLCAs) may be defined.
- 7.4.26 The assessment of landscape effects will be carried out at a scale *"appropriate to the context into which the development proposal will be introduced"* (Ref 7-43) defined in published studies at the district level. The LCAs that will be scoped into the LVIA are summarised below and detailed in Table 7-7. The baseline landscape character will be mapped and described in detail in the PEIR and ES.

National Landscape Character Assessments

- 7.4.27 Parts of ten National Character Areas (NCA) defined by Natural England (Ref 7-51) fall within the LVIA Study Area. The North West Inshore (Ref 7-17) Marine Character Area (MCA) also covers part of the LVIA Study Area in the west.
- 7.4.28 The geographical extent of LCAs in published assessments at the national level are generally large and extend beyond the LVIA Study Area. As explained in paragraph 5.14 of GLVIA3, *"broad-scale assessments at national or regional level can be helpful in setting the landscape context, but are unlikely to be helpful on their own as the basis for LVIA"*. LCAs defined at the national scale will therefore be included to provide context but effects on these receptors will not be assessed.

Regional and County Landscape Character Assessments

- 7.4.29 At the regional level, landscape character in the eastern part of the LVIA Study Area is covered by the East Midlands Regional Landscape Character Assessment (Ref 7-55), encompassing Regional

Landscape Character Types (RCTs) and Areas (RCAs). The majority of the LVIA Study Area is not covered by regional landscape character assessments. As with NCAs, regional assessments are large scale and provide context to more detailed studies at the local level. Therefore, RCTs and RCAs will be scoped out of the LVIA presented in the PEIR and ES.

- 7.4.30 Parts of the LVIA Study Area are also covered by landscape character assessments at the county level. This comprises the Landscape Character of Derbyshire (Ref 7-56), and the Staffordshire 'Planning for Landscape Change' Supplementary Planning Guidance (Ref 7-57). The effects on these receptors will be assessed in the LVIA.

District Landscape Character Assessments

Peak District National Park Landscape Character Assessment

- 7.4.31 Parts of the LVIA Study Area cover the boundary and setting of the PDNP. Landscape character is defined by the PDNP Authority in the Peak District Landscape Strategy 2022-31 (Ref 7-54). The LVIA Study Area encompasses Landscape Character Types (LCT) which fall within Landscape Character Areas (LCA). The effects on these receptors will be assessed in the LVIA.
- 7.4.32 The Landscape and Settlement Character of Staffordshire Moorlands (Ref 7-58) and the Churnet Valley Landscape Character Assessment (Ref 7-59) use the LCTs and LCAs as defined by Staffordshire County Council in 'Planning for Landscape Change' Supplementary Planning Guidance (Ref 7-57). These assessments retain the same names of the LCT but has further developed the key characteristics and features of landscape character for areas within each jurisdiction. This includes a more in-depth assessment identifying the distinctive qualities of the individual settlements. In the Churnet Valley assessment sub areas that are *"named after the settlements within the Churnet Valley which they either contain or abut"* have been defined.
- 7.4.33 The Wirral Landscape Character Assessment (Ref 7-60) *"provides an outline of the landscape character of the Borough and classifies the landscape and character of Wirral through a series of area profiles"*.
- 7.4.34 The Cheshire East Landscape Character Assessment (Ref 7-61) aims to provide an objective description of the landscape and a strategy for managing the landscapes and guiding landscape change in the Borough. Further detail is also provided for some Local Landscape Character Areas (LLCA) defined as part of the local designation of landscape areas in East Cheshire (Ref 7-52).
- 7.4.35 The LVIA Study Area encompasses LCTs and LCAs within the Cheshire West and Chester Local Landscape Character Assessment - Landscape Strategy 2016.
- 7.4.36 The High Peak Landscape Character Assessment (Ref 7-63) uses the LCTs and LCAs as defined by Derbyshire County Council in the Landscape Character of Derbyshire (Ref 7-56). The assessment retains the same names of the LCT but further develops the key characteristics and features of landscape character for areas within this jurisdiction.
- 7.4.37 Derbyshire Dales Landscape Character Assessment (Ref 7-64) *"is an abridged version"* of the Derbyshire County Council LCA in the Landscape Character of Derbyshire (Ref 7-34). The assessment retains the same names of the LCT. It has been prepared specifically for use within the Derbyshire Dales jurisdiction describing only those areas that exist within the District.
- 7.4.38 East Staffordshire Borough Council uses the LCTs and LCAs defined by Staffordshire County Council in 'Planning for Landscape Change' Supplementary Planning Guidance (Ref 7-56) as part of its evidence base.

Landscape character summary

- 7.4.39 A summary of the key landscape characteristics and published landscape character assessments for each part of the Proposed Development is set out below.

Breedon Capture Facility

- 7.4.40 The site and LVIA Study Area, which lie within the PDNP, are set within a predominantly rural, elevated landscape where ridges of summits form the skyline, and steeply sloped valley sides connect to the dales. Vegetation cover is predominantly pasture with fields separated by characteristic drystone walls. Belts and blocks of woodland along the valley sides are also notable. Settlement is sparse and infrastructure is limited. The quarry which defines the site is an incongruous element, but earthworks and vegetation minimise its perception within the wider landscape.
- 7.4.41 The Breedon cement production plant at Hope, where the Breedon Capture Facility will be located is within the East Midlands region within Derbyshire. At the local level it is located along the boundary of High Peak Borough Council and Derbyshire Dales District Council. At the national level, it is located along the boundary of NCA 51: Dark Peak and NCA 52: White Peak (Ref 7-51) but has a limited geographical extent at the NCA level.
- 7.4.42 Relevant LCAs defined in the Peak District Landscape Strategy 2022-31 (Ref 7-54) will be used to assess likely effects on the PDNP and its setting. Outside of the PDNP, the Landscape Character of Derbyshire (Ref 7-56) will be used to assess likely effects on landscape receptors.
- 7.4.43 As the High Peak Landscape Character Assessment (Ref 7-63) and Derbyshire Dales Landscape Character Assessment (Ref 7-64) are based upon the Landscape Character of Derbyshire (Ref 7-56), effects on receptors defined in these assessments will not be assessed.

Tarmac and Buxton Lime Capture Facilities

- 7.4.44 The Tunstead cement production plant and Buxton Lime plant, where the Tarmac Capture Facility and Buxton Lime Capture Facility are to be located, lie just outside the PDNP and within its setting. The LVIA Study Area forms the boundary of the elevated rural landscape and the lower valleys between the ridges. Vegetation cover is predominantly pasture with fields separated by characteristic drystone walls. Belts and fragmented small blocks of woodland are prevalent around the site, providing screening and enclosure. Settlement within the rural landscape is sparse, but larger settlements such as Buxton, Harpur Hill, and Chapel-En-Le-Frith are located in the valleys with main roads and the railway line connecting them. Infrastructure becomes more frequent outside of the PDNP. Mineral extraction and quarry sites are incongruous elements, but earthworks and vegetation minimise their perception within the wider landscape.
- 7.4.45 These facilities are located within the High Peak Borough of Derbyshire with the LVIA Study Area extending into the Derbyshire Dales District and the Moorlands District of Staffordshire.
- 7.4.46 At the national level these facilities occupy small parts of NCA 52: White Peak (Ref 7-51) with the LVIA Study Area extending into NCA 51: Dark Peak and NCA 53: South West Peak.
- 7.4.47 The Peak District Landscape Strategy 2022-31 (Ref 7-54) will be used to assess areas within the LVIA Study Area that are located in the PDNP and its setting. Landscape Character of Derbyshire (Ref 7-56) will be used to assess impacts on landscape receptors outside of the PDNP. LCAs where there are likely to be physical impacts on the fabric of the landscape will be scoped into the assessment.

- 7.4.48 The High Peak Landscape Character Assessment (Ref 7-63) and Derbyshire Dales Landscape Character Assessment (Ref 7-64) are based upon the Landscape Character of Derbyshire (Ref 7-56). The Landscape and Settlement Character of Staffordshire Moorlands (Ref 7-58) and the Churnet Valley Landscape Character Assessment (Ref 7-59) are based upon the Staffordshire 'Planning for Landscape Change' Supplementary Planning Guidance (Ref 7-57). Therefore, these LCAs will be included to provide context but effects on these receptors will not be assessed.

Holcim Capture Facility

- 7.4.49 The Holcim cement production plant at Cauldon, where the Holcim Capture Facility will be located, lies just outside the PDNP but within its setting. The site and LVIA Study Area form the boundary of the rural landscape to the east and the lower valleys to the south-west. Vegetation cover is predominantly pasture with fields separated by hedgerows with hedgerow trees. Belts of woodland are prevalent around the watercourses within the valleys surrounding the more elevated hills. Settlement within the area is sparse and limited to smaller settlements and scattered farms and individual properties. Aside from quarries, which are often enclosed by earthworks and vegetation, infrastructure is limited to the network of minor roads.
- 7.4.50 The Holcim Capture Facility will be located within Staffordshire. At the local level the Holcim Capture Facility is located within the district of Staffordshire Moorlands. The LVIA Study Area also extends into the borough of East Staffordshire and the Derbyshire Dales district of Derbyshire.
- 7.4.51 The Holcim Capture Facility covers small parts of NCA 52: White Peak (Ref 7-51) with the LVIA Study Area extending into NCA 64: Potteries and Churnet Valley and NCA 68: Needwood and South Derbyshire Claylands.
- 7.4.52 The Peak District Landscape Strategy 2022-31 (Ref 7-54) will be used to assess areas within the LVIA Study Area that are located in the PDNP and its setting.
- 7.4.53 For the site of the Holcim Capture Facility and areas outside of the PDNP and its setting, the Landscape Character of Derbyshire (Ref 7-56) and the Staffordshire 'Planning for Landscape Change' Supplementary Planning Guidance (Ref 7-57) will be used to assess impacts on landscape receptors. LCA where there are likely to be physical impacts on the fabric of the landscape will be scoped into the assessment.
- 7.4.54 The Landscape and Settlement Character of Staffordshire Moorlands (Ref 758), and the Churnet Valley Landscape Character Assessment (Ref 7-59) are based upon the Staffordshire 'Planning for Landscape Change' Supplementary Planning Guidance (Ref 7-57). Furthermore, East Staffordshire Borough Council also uses the LCTs and LCAs defined by Staffordshire County Council in 'Planning for Landscape Change' Supplementary Planning Guidance (ibid) as part of its evidence base. The Derbyshire Dales Landscape Character Assessment (Ref 7-64) is also based upon the Landscape Character of Derbyshire (Ref 7-56). Therefore, these LCAs will be included to provide context but effects on these receptors will not be assessed.

North Feeder AGI

- 7.4.55 The North Feeder AGI shares many of the characteristics of the Breedon Capture Facility as described in Section 7.3.10.2. The site options are located to the south of the settlement of Chapel-En-Le Frith and the railway line, including the Dove Holes tunnel.
- 7.4.56 The North Feeder AGI is located within the High Peak borough of Derbyshire and within the setting of the PDNP. The LVIA Study Area also extends into the PDNP.

- 7.4.57 The North Feeder AGI is located along the boundary of NCA 51: Dark Peak, NCA 52: White Peak, and NCA 53: South West Peak (Ref 7-51) but is very small in scale compared to these large receptors.
- 7.4.58 The Peak District Landscape Strategy 2022-31 (Ref 7-54) will be used to assess areas within the LVIA Study Area that are located in the PDNP and its setting. For areas outside of the PDNP, the Landscape Character of Derbyshire (Ref 7-56) will be used to assess impacts on landscape receptors within the LVIA Study Area for the North Feeder AGI.
- 7.4.59 As the High Peak Landscape Character Assessment (Ref 7-63) is based upon the Landscape Character of Derbyshire (Ref 7-56), this local level LCA will therefore be included to provide context but effects on these receptors will not be assessed.

Central Feeder AGI

- 7.4.60 The landscape character of the Central Feeder AGI site option is influenced by its proximity to the settlement of Macclesfield. The landform is undulating and predominantly rural with small irregular fields bound by hedgerows with hedgerow trees and the A536 and other minor roads. Other infrastructure includes overhead power lines. Aside from the south-western extent of Macclesfield, settlement is sparse.
- 7.4.61 The Central Feeder AGI and the LVIA Study Area are located within Cheshire East and entirely within NCA 61: Shropshire, Cheshire and Staffordshire (Ref 51). The site forms a very small part of this NCA.
- 7.4.62 The Cheshire East Landscape Character Assessment (Ref 61) will be used to assess impacts on landscape receptors within the LVIA Study Area for the Central Feeder AGI. This will include an assessment of likely impacts on local landscape designations provided in the Cheshire East Local Landscape Designation review (Ref 30).

Peak Cluster Pipeline East

- 7.4.63 The route corridor of the Peak Cluster Pipeline East passes through the rural landscape, typically following lower-lying landform and avoiding infrastructure, scattered farms and individual properties. The northern most part is located within the PDNP and shares many of the characteristics of the Breedon Capture Facility described in Section 7.3.10.3. Most of the route corridor is located within the setting of the PDNP. The route corridor generally avoids woodland but does cross through field boundaries. Infrastructure is more prevalent near to the larger settlements such as Chapel-En-Le Frith, Whaley Bridge, Macclesfield, Congelton, and Leek.
- 7.4.64 The Peak Cluster Pipeline East passes through Derbyshire and Staffordshire and Cheshire East. At the local level it crosses parts of High Peak, Derbyshire Dales, Staffordshire Moorlands and Cheshire East.
- 7.4.65 At the national level the route passes through parts of NCA 51: Dark Peak, NCA 52: White Peak, NCA 53: South West Peak, NCA 61: Shropshire, Cheshire and Staffordshire, and NCA 64: Potteries and Churnet Valley (Ref 7-51).
- 7.4.66 The Landscape Character of the PDNP as defined in the Peak District Landscape Strategy 2022-31 (Ref 7-54) will be used to assess impacts on the PDNP and its setting.
- 7.4.67 For areas of the route corridor outside of the PDNP, the Landscape Character of Derbyshire (Ref 7-56), the Staffordshire 'Planning for Landscape Change' Supplementary Planning Guidance (Ref 7-57), and the Cheshire East Landscape Character Assessment (Ref 7-61) will be used to assess

impacts on landscape receptors within the LVIA Study Area. LCAs where there are likely to be physical impacts on the fabric of the landscape will be scoped into the assessment.

Connection AGI 1

- 7.4.68 The location of the Connection AGI 1 site option is influenced by its proximity to the settlement of Holmes Chapel. The landform is undulating, with valley slopes to either side of the River Dane. The landscape is predominantly rural with small to medium sized irregular fields bound by hedgerows with hedgerow trees. The River Dane is a notable watercourse to the south of the site option. Infrastructure is dominant with the M6 motorway and numerous smaller interconnecting roads linking the smaller settlements to Holmes Chapel and Middlewich.
- 7.4.69 The Connection AGI 1 is located within Cheshire East but lies at the boundary of Cheshire West and Chester. The LVIA Study Area extends across both areas. It is located entirely within NCA 61: Shropshire, Cheshire and Staffordshire (Ref 7-51) but forms a very small part of the receptor.
- 7.4.70 The Cheshire East Landscape Character Assessment (Ref 7-61), will be used to assess impacts on landscape receptors within the site and LVIA Study Area for the Connection AGI 1.

Peak Cluster Pipeline Central

- 7.4.71 The Peak Cluster Pipeline Central crosses the gently undulating landscape of the Shropshire, Cheshire and Staffordshire plain, passing through a narrow part of the elevated Cheshire Sandstone Ridge. Much of this is a mixture of pasture and arable fields generally bound by hedgerows and scattered hedgerow trees. The route corridor generally avoids infrastructure, woodland and scattered farms and individual properties in all but a few locations where built elements constrain the route.
- 7.4.72 This section of the proposed underground pipeline passes through Cheshire East and Chester West where it coincides with parts of the LVIA Study Area.
- 7.4.73 The Peak Cluster Pipeline Central crosses parts of NCA 61: Shropshire, Cheshire and Staffordshire, and NCA 62: Cheshire Sandstone Plain. A small part of the LVIA Study Area passes through the boundary with NCA 60: Mersey Valley (Ref 7-51).
- 7.4.74 The Cheshire East Landscape Character Assessment (Ref 7-61), and the Cheshire West and Chester Local Landscape Character Assessment - Landscape Strategy 2016 (Ref 7-62) will be used to assess impacts on landscape receptors within the LVIA Study Area. LCA where there are likely to be physical impacts on the fabric of the landscape will be scoped into the assessment. Where there are small LCAs, these may be combined to create Local Landscape Character Areas (LLCA) by the Applicant. This will provide a consistent and proportionate level of baseline information against which to assess the likely landscape effects of the Proposed Development.

Peak Cluster Pipeline West and Coastal AGI to MLWS Pipeline

- 7.4.75 The Peak Cluster Pipeline West passes through the centre of the Wirral Peninsula from the Connection AGI 2. It then connects with the Coastal AGI before the MLWS Pipeline continues to the coast near Moreton. The land is elevated around the mid-cheshire ridge but is otherwise low-lying and flat. The land use becomes increasingly pastoral as it transitions to the estuarine and coastal landscape. Fields are typically small scale with hedgerows and hedgerow trees with occasional smaller blocks of woodland. The landscape is heavily influenced by large settlements along the estuaries of the River Mersey and River Dee with infrastructure dominating. Whilst the route corridor crosses the rural landscape and generally avoids settlement and infrastructure, the constrained nature of the peninsula means that these strongly inform its character.

- 7.4.76 The Peak Cluster Pipeline West and Coastal AGI to MLWS Pipeline passes through Chester West and Cheshire and Wirral. It also crosses parts of NCA 59: Wirral, and NCA 61: Shropshire, Cheshire and Staffordshire. A small part of the LVIA Study Area passes through the boundary with NCA 58: Merseyside Conurbation, and NCA 60: Mersey Valley (Ref 7-51). A large geographical extent for NCA 59: Wirral is crossed by the proposed pipeline.
- 7.4.77 The Cheshire West and Chester Local Landscape Character Assessment - Landscape Strategy 2016 (Ref 7-62), and the Wirral Landscape Character Assessment (Ref 7-60) will be used to assess impacts on landscape receptors within the LVIA Study Area for the Peak Cluster Pipeline West and Coastal AGI to MLWS Pipeline. Where there are small LCAs, these may be combined to create Local Landscape Character Areas (LLCA) by the Applicant. This will provide a consistent and proportionate level of baseline information against which to assess the likely landscape effects of the Proposed Development.

Connection AGI 2

- 7.4.78 The Connection AGI 2 site options are located within the flat, low-lying remnants of rural landscape between the settlement edge of Ellesmere Port and Chester. The landscape contains small to medium sized fields bound with hedgerows and scattered with hedgerow trees. The area is heavily influenced by infrastructure, major settlement and the industrial infrastructure along the River Mersey, but also the network of motorways, major highways and rail routes that converge near this location between Wales and England.
- 7.4.79 The Connection AGI 2 and LVIA Study Area are located within Cheshire West and Chester and entirely within NCA 61: Shropshire, Cheshire and Staffordshire (Ref 7-51). A small part of the LVIA Study Area crosses the boundary with NCA 60: Mersey Valley.
- 7.4.80 The Cheshire West and Chester Local Landscape Character Assessment - Landscape Strategy 2016 (Ref 7-62) will be used to assess impacts on landscape receptors within the site and LVIA Study Area for the Connection AGI 2. Where there are small LCAs, these may be combined to create Local Landscape Character Areas (LLCA) by the Applicant. This will provide a consistent and proportionate level of baseline information against which to assess the likely landscape effects of the Proposed Development.

Coastal AGI

- 7.4.81 The Coastal AGI site options are located within the flat, low-lying Wirral peninsula. Site options range from locations to the north-west of Ellesmere Port through to Moreton near the coast. Fields are typically small scale with hedgerows and hedgerow trees with occasional smaller blocks of woodland. The landscape is heavily influenced by large settlements along the estuaries of the River Mersey and River Dee with infrastructure being a dominant feature. Whilst the route corridor passes through the rural landscape and generally avoids settlement, major highways, and infrastructure, the constrained nature of the peninsula means that these strongly inform the character.
- 7.4.82 The Coastal AGI site options and LVIA Study Area are located within Chester West and Cheshire and Wirral. The LVIA Study Area also extends near to the Flintshire area of Wales.
- 7.4.83 The Coastal AGI site options are located predominantly within NCA 59: Wirral with a small part extending into NCA 61: Shropshire, Cheshire and Staffordshire. A small part of the LVIA Study Area lies along the boundary with NCA 58: Merseyside Conurbation, and NCA 60: Mersey Valley (Ref 7-51).
- 7.4.84 The North West Inshore MCA lies within the LVIA Study Area for the Coastal AGI site options.

- 7.4.85 The Cheshire West and Chester Local Landscape Character Assessment - Landscape Strategy 2016 (Ref 7-62), and the Wirral Landscape Character Assessment (Ref 7-60) will be used to assess impacts on landscape receptors within the LVIA Study Area for the Coastal AGI site options. Where there are small LCAs, these may be combined to create Local Landscape Character Areas (LLCA) by the Applicant. This will provide a consistent and proportionate level of baseline information against which to assess the likely landscape effects of the Proposed Development.
- 7.4.86 The landscape character summary including which of the published landscape character assessments are proposed to be scoped in and out of the LVIA is presented in Appendix F.

Views and visual amenity

- 7.4.87 Preliminary bare earth ZTVs are shown in Figure 7.4a to 7.4e for the Capture Facilities and Coastal AGI with preliminary screened ZTVs are shown in Figure 7.5a to 7.5e respectively. These have been prepared to inform this Scoping Report, based on the design information currently available. As certain features of the Proposed Development are unknown at this stage, such as the location of ancillary buildings and structures, these have not been included in the ZTVs. Further ZTVs will be produced to support the PEIR and ES.
- 7.4.88 The preliminary ZTVs give an indication of the potential visibility of the proposed current maximum parameters of each Capture Facility, based on terrain alone and considering the influence of screening vegetation and buildings.

Visual receptor groups

- 7.4.89 Visual receptors likely to experience views of the Proposed Development have been identified through interrogation of the ZTV, desktop analysis of maps and aerial photography, and fieldwork surveys. Where a collection of visual receptors in the same category are likely to experience similar views, they have been grouped. These are set out in Table 7-7 below.

Table 7-7: Visual Receptors

Receptor type	Receptor or receptor groups
Residents of local communities	Residents of larger settlements including Leek, Biddulph, Congleton, Macclesfield, Chapel-en-Le-Frith, Middlewich, Chester, Ellesmere Port, and Birkenhead. Residents of smaller settlements and more isolated properties within the open countryside, including residents of scattered farms and individual properties.
People visiting the PDNP	Visitors to the PDNP
People travelling on the transport network	People travelling through the landscape including those travelling on major and local road networks, railway lines and bus routes.
People travelling along promoted recreational routes	People travelling along Public Rights of Way (PRoW) which are promoted routes, including National Trails, the National Cycle Network and those identified on Ordnance Survey maps.
People travelling along recreational routes which are not promoted routes	People travelling along PRoWs and permissive paths which are not promoted routes

Receptor type	Receptor or receptor groups
People at work	People working indoors or outdoors
People involved in outdoor sports and other recreational activities	People engaged in sporting or recreational activities
Visitors to places of interest	People visiting outdoor tourist attractions such as Beeston Castle, Lyme Park and Chester Zoo.

Representative viewpoints

- 7.4.90 Representative viewpoints have been selected on the basis that they cover a range of viewing distances, elevations and orientations from locations with different viewing experiences of the landscape and the Proposed Development. In some cases, a viewpoint may therefore be representative of more than one visual receptor group. A selection of representative views will be supported by photomontages illustrating the Proposed Development in operation. The Applicant will seek the agreement of the relevant Local Planning Authorities on the selection of viewpoints, and this will be set out in the ES.
- 7.4.91 A limited number of viewpoints have been selected to assist in the assessment of the temporary impacts of the construction of the Peak Cluster Pipeline corridor on people's views and visual amenity. These viewpoints have been identified with reference to viewpoints shown on OS 1:25,000 mapping.
- 7.4.92 Appendix F details these representative viewpoint locations proposed and the reason for inclusion in the LVIA. The location of the proposed representative viewpoints is shown on Figure 7.6a to 7.6e.
- 7.4.93 The permanent structures associated with the AGI sites are small, and visual impacts are likely to be localised. Therefore, the Applicant will seek to agree the viewpoints relating to these elements with Local Planning Authorities and this will be set out in the ES.

7.5 Identification of Potential Effects

- 7.5.1 Potential effects on landscape character and visual amenity which will be considered include the following:

Construction

Landscape Character

- Temporary physical changes to the landscape fabric due to construction of elements at the Capture Facilities, Coastal AGI, Peak Cluster Pipeline, Coastal AGI to MLWS Pipeline(s), AGIs and BVSs due to alteration to landform, removal of vegetation, excavation of materials and temporary storage of materials including soil storage heaps, stockpiles of construction materials;
- Temporary changes to the character of the landscape within the LVIA Study Area as a result of construction activities including the introduction and presence of construction compounds and machinery, temporary accommodation, laydown and materials storage areas, temporary access roads and lighting; and
- Temporary impacts on the statutory purposes and special qualities of the PDNP or its setting due to construction of the Proposed Development.

Visual Amenity

- Temporary disruption to people's views and visual amenity due to construction of the Proposed Development.

Operation

Landscape Character

- Permanent changes to the physical landscape fabric including loss of existing landscape elements, changes to landform and the introduction of new built form and planting at the Capture Facilities, Coastal AGI, AGIs and BVSS;
- Permanent change to the character of the landscape within the LVIA Study Area as a result of the introduction and presence of new built form elements at the Capture Facilities, Coastal AGI, AGIs and BVSS; and
- Permanent impacts on the statutory purposes and special qualities of the PDNP or its setting due to existence and operation of the Proposed Development.

Visual Amenity

- Long term changes to people's views and visual amenity due to changes to the physical landscape fabric, the introduction of new built form and planting at the Capture Facilities, Coastal AGI, AGIs and BVSS.

7.6 Scope and Methodology

7.6.1 This section outlines the scope and methodology that will be employed for identifying and assessing likely landscape and visual effects. The methodology for the LVIA involves the following stages:

- Review published landscape character assessments, studies, relevant supporting evidence base documents, aerial photography and mapping, and undertake fieldwork to define the baseline and to define the extent of the LVIA Study Area within which there is potential for landscape and visual effects;
- Define the landscape and visual receptors and describe the landscape and visual baseline;
- Embed mitigation and enhancement measures into the Proposed Development to avoid or minimise adverse landscape and visual effects and maximise opportunities for landscape integration and enhancement;
- Determine the sensitivity of landscape and visual receptors, by considering the value attached to the landscape or views and susceptibility to change of the receptor;
- Assess the magnitude of impact of the Proposed Development in relation to size or scale, geographical extent, duration and reversibility; and
- Assess the significance of effect by considering the relationship between the sensitivity of the receptor and the magnitude of impact and determine which effects are significant.

Scope

7.6.2 The assessment of the likely landscape and visual effects of the Proposed Development will be undertaken for the following scenarios:

- Current baseline (winter and summer) – reflective of the conditions which exist at the time of gathering baseline environmental data and undertaking the LVIA;
- Future baseline (winter and summer) – reflective of the conditions that will be experienced in the future, immediately prior to construction of the Proposed Development;
- The peak of construction activity, in winter;
- Year 1 of operation, in winter, to reflect a worst-case assessment; and
- Year 15 of operation, in summer, to reflect the entirety of the Proposed Development in operation, when proposed vegetation has matured or achieved its design intention.

Assessment of landscape effects

Designated landscapes

- 7.6.3 The LVIA will describe relevant designated landscapes and the related setting in the ES. The impacts of the construction and operation of the Proposed Development which may affect the purposes of existing landscape designations, and the resulting effects will be described in narrative terms. Landscape designations will also inform the value attached to the landscape of the Landscape Character Areas (LCA) which will form the basis of the assessment of landscape effects. These considerations will be assessed separately to avoid double-counting effects.
- 7.6.4 The purposes of National Parks under the PDNPs and National Parks and Access to the Countryside Act 1949 relate to:
- (a) conserving and enhancing the natural beauty, wildlife and cultural heritage of the areas specified in the next following subsection; and
- (b) promoting opportunities for the understanding and enjoyment of the special qualities of those areas by the public.
- 7.6.5 Section 245 (Protected Landscapes) of the Levelling-up and Regeneration Act 2023 (LURA) amended the duty on relevant authorities in respect of their functions which affect land in National Parks, National Landscapes, and the Norfolk and Suffolk Broads (collectively referred to as Protected Landscapes) in England. Relevant authorities have statutory duties to seek to further these purposes in relation to National Parks and National Landscapes under section 11A(1A) of the National Parks and Access to the Countryside Act 1949 and section 85 of the Countryside and Rights of Way Act 2000. The government published guidance for relevant authorities on seeking to further the purposes of Protected Landscapes in December 2024 and this has been reviewed and considered in the design of the Proposed Development.
- 7.6.6 These legal duties also relate to development proposals that are situated outside National Park or National Landscape boundaries, but which might have an impact on their setting or protection. The LVIA will explain how the Applicant has considered these legal duties in developing the design of the Proposed Development.

Methodology for the assessment of effects on designated landscapes

- 7.6.7 Point 5(12) of the Landscape Institute's Notes and Clarifications on Aspects of GLVIA3 states that when assessing effects on designated landscapes and special landscape qualities the designation should *"be treated as a landscape receptor, and the assessor should report on how the special qualities (i.e. the components of natural beauty) and/or purposes of designation (if they relate to additional or different factors other than natural beauty) of a designated landscape would be affected."*

- 7.6.8 The LVIA will include a separate assessment of the likely effects on the purposes and special qualities of the PDNP. In the absence of specific guidance for England, the approach will be informed by the NatureScot Special Landscape Qualities - Guidance on assessing effects (NatureScot, 2025). This methodology advocates a narrative approach, rather than numerical scores or tables. It recognises that the high sensitivity of the designated landscape resource is inherent, irrespective of numbers of receptors. This accords with the approach within GLVIA3 where nationally designated landscapes typically have the highest value and are highly susceptible to changes in landscape. Detailed assessments will be carried out using the checklist in Annex I of the NatureScot guidance.
- 7.6.9 As noted in LI TGN 01/24 (Ref 7-44), the geographical extent of the setting of Protected Landscapes are not defined in policy or on maps. Therefore, the assessment will refer to which and to what extent the Applicant considers the LCAs which form the basis of the assessment contribute to the setting of the designated area.

Landscape baseline

- 7.6.10 Landscape receptors will be identified via a review of published landscape character assessments, maps and aerial photography, relevant planning policy and fieldwork surveys. A baseline description will then be provided for each of the identified landscape receptors.
- 7.6.11 Existing landscape features that could be subject to change will be described in their own right with reference to the Arboricultural Impact Assessment (AIA) and hedgerow surveys, in accordance with point 5(2) of LI TGN 01/24 (ibid).
- 7.6.12 Published landscape character assessments at the national, regional and local level will be reviewed to identify Landscape Character Types (LCT) and Landscape Character Areas (LCA).
- 7.6.13 The geographical extent of LCAs in published assessments at the national level are generally large and extend beyond the LVIA Study Area. As explained in paragraph 5.14 of GLVIA3, *“broad-scale assessments at national or regional level can be helpful in setting the landscape context but are unlikely to be helpful on their own as the basis for LVIA”*. These have therefore been included to provide context but effects on these receptors will not be assessed.
- 7.6.14 The key characteristics of published LCAs will be set out to provide a clear audit trail back to the original studies. This information will be critically reviewed and may inform the definition of Local Landscape Character Areas (LLCA) to provide full coverage of the LVIA Study Area or additional detail.

Tranquillity

- 7.6.15 Tranquillity is a perceptual aspect of landscape which can also contribute to its value. Tranquillity will be assessed with reference to mapping published by CPRE: The Countryside Charity and fieldwork. This information will be supplemented with more detailed notes captured during fieldwork, using the same terminology as the factors set out in to refine the definition of LCAs that form the basis of the assessment of landscape effects.

Night time baseline

- 7.6.16 The night time baseline will be described with reference to England’s Light Pollution and Dark Skies map published by CPRE: The Countryside Charity. Reference will also be made to the Institute of Lighting Professionals Guidance Note 1 (Ref 7-65) for the reduction of obtrusive light. This guidance defines three types of light pollution as skyglow, glare and light intrusion and establishes criteria for environmental zones that will be applied in the LVIA. A measured lighting survey is not considered proportionate to the likely landscape and visual effects. Therefore, these criteria will be

applied to each L/LCA to help describe the relative darkness of different areas in the baseline landscape and how these might change as a consequence of the Proposed Development. A qualitative assessment of night time lighting effects on people's views will be informed by fieldwork for residents of local communities. Other visual receptors will not be considered on the basis that either they would generally not be present at night (e.g. people travelling along public rights of way) or their immediate context would be brightly lit if they were present at night (e.g. employment or formal sports).

Sensitivity of landscape receptors

7.6.17 Judging landscape sensitivity will be a two-part process of assessing:

- *Value attached to the landscape* – relates to the existing landscape, this will be determined at the baseline stage in line with paragraph 5.19 of GLVIA3, which states that “as part of the baseline description the value of the potentially affected landscape should be established”; and
- *Susceptibility to change* – which is considered in relation to the Proposed Development.

Value attached to the landscape

7.6.18 The approach to assessing the value attached to the landscape will be informed by the Landscape Institute Technical Guidance Note (TGN) 02/21: Assessing landscape value outside national designations (Ref 7-41) and will follow a four-stage process:

- Stage 1 identify if the landscape is covered by any landscape designations;
- Stage 2 consider each of the factors listed in Table 7-8 below which have been developed with reference to Table 1 of TGN 02/21 and are pertinent and most important to understanding its value;
- Stage 3 make an assessment of the value attached to the landscape and assign value based on a five-point scale, clearly articulating the reasons for these judgements; and
- Stage 4: assess whether there is sufficient evidence through designation or the value attached to the landscape for the receptor to be considered valued landscape in the context of National Planning Policy Framework (NPPF) paragraph 187(a).

Table 7-8: Establishing Landscape Value Criteria

Stage 1 – Landscape designations	Stage 2 - Define landscape value factors with reference to TGN 02/21	Criteria	Typical Description
Landscape with statutory status or national policy protection: National Park, National Landscape, or World Heritage Site. Local landscape designation, such as Special Landscape Area or Area of Great Landscape Value, supported by policy and a detailed evidence base.	Natural heritage - Landscape with clear evidence of ecological, geological, geomorphological or physiographic interest which contribute positively to the landscape. Cultural heritage - Landscape with clear evidence of archaeological, historical or cultural interest which contribute positively to the landscape. Landscape condition - Landscape which is in a good physical state both with regard to individual elements and overall landscape structure. Associations - Landscape which is connected with notable people, events and the arts. Distinctiveness - Landscape that has a strong sense of identity. Recreational - Landscape offering recreational opportunities where experience of landscape is important. Perceptual (Scenic) - Landscape that appeals to the senses, primarily the visual sense.	Very high	A designated landscape with statutory status (National Park or National Landscape/AONB). Valued landscape in the context of NPPF paragraph 187 (a).
		High	A locally designated landscape supported by a detailed evidence base or with other strong indicators of value, which may include other relevant designations such as ancient woodland or conservation areas, with identified quality in the development plan or evidence base. May be considered valued landscape in the context of NPPF paragraph 187(a) with strong supporting evidence.
		Medium	Unlikely to be a designated for landscape quality but may exhibit some indicators of value which are identified in the development plan or evidence base and are important at the community level.
		Low	Not designated for landscape quality and likely to exhibit few indicators of value which are identified in the development plan or evidence base.
No relevant designations.			

Stage 1 – Landscape designations	Stage 2 - Define landscape value factors with reference to TGN 02/21	Criteria	Typical Description
	Perceptual (wildness and tranquillity) - Landscape with a strong perceptual value notably wildness, tranquillity and/or dark skies. Functional - Landscape which performs a clearly identifiable and valuable function, particularly in the healthy functioning of the landscape.	Very low	A landscape dominated by industry or infrastructure or which is damaged or degraded landscape, not designated for landscape quality and not likely to exhibit indicators of value which are identified in the development plan or evidence base.

- 7.6.19 A conclusion will be drawn on the value attached to the landscape for each landscape receptor considering the overall weight of evidence.

Valued landscape

- 7.6.20 The principle of “*valued landscape*” in England is supported by paragraph 187 of the NPPF 2025. According to paragraph A4.2.11 of TGN 02/21, a ‘valued landscape’ is an area identified as having sufficient landscape qualities to elevate it above other more everyday landscapes. There is therefore a high bar for an area to be considered valued landscape in the context of the NPPF.
- 7.6.21 Paragraph A4.2.5 of TGN 02/21 states that, “*where a landscape has a statutory status, such as a National Park or AONB, it is self-evident that it is a valued landscape*”. Therefore, where such landscapes are present within the LVIA Study Area, these will be attributed very high value and are recognised as valued landscapes in the context of the NPPF.
- 7.6.22 A different approach will be taken to determine whether landscapes outside of nationally designated landscapes can be considered valued landscape in the context of the NPPF. For a landscape without statutory status to be considered valued landscape in the context of the NPPF it must be supported by strong evidence. The assessment will therefore consider each of the criteria set out in Table 7-9, references in Local Plan policy and evidence base, including whether there are existing local landscape designations in forming an overall judgement on value. Landscapes with high value may also be considered valued landscapes in the context of the NPPF.

Susceptibility of landscape receptors to change

- 7.6.23 GLVIA3 paragraph 5.40 defines the susceptibility to change of landscape receptors as the ability of the landscape receptor to accommodate the Proposed Development without undue consequences for the maintenance of the baseline situation and/or the achievement of landscape planning policies and strategies (paragraph 5.40). The LI clarified in point 5(4) of TGN 01/24 that relevant criteria will be dependent upon the development type being considered and should be tailored to the project.
- 7.6.24 The features and characteristics which are more or less susceptible to the type of changes proposed will be set out for each LCA. The narrative will provide a clear explanation based upon analysis of the landscape receptor and the extent to which it is able to accommodate the type of change arising from the specific proposal.
- 7.6.25 Table 7-9 sets out examples of characteristics and features of landscapes which may indicate higher and lower susceptibility in respect of the Proposed Development.

Table 7-9: Considerations for Landscape Susceptibility

Landscape features or characteristics	Indicators of higher landscape susceptibility	Indicators of lower landscape susceptibility
Landscape features or characteristics	Indicators of higher landscape susceptibility.	Indicators of lower landscape susceptibility.
Field pattern, scale and enclosure	Small scale fields. Complex or irregular field pattern. Ancient field patterns. Field boundaries formed by low fences or walls or hedges with few hedgerow trees.	Large scale fields. Simple, regular or rectilinear field pattern. Uniform field pattern. High field boundaries.
Landform	Steep topography.	Flat landscapes.

Landscape features or characteristics	Indicators of higher landscape susceptibility	Indicators of lower landscape susceptibility
	Exposed hillsides. Irregular or complex landform. Narrow valleys and ridges. Distinctive landform features.	Expansive lowland landscapes. Uniform landform. Landscapes with no or minimal distinctive landform features.
Land cover	Pastures, particularly where grazing forms key characteristic of the landscape. Significant woodland cover. Parkland or designed landscapes. Natural or semi-natural land cover, particularly where conservation or restoration is a priority.	Large-scale arable land, particularly monoculture or with evidence of intensive farming practices.
Tranquillity/ human influences	Absence of human influences / natural landscapes. Infrequent built form. Overarching rural character. Remote, tranquil, spiritual or peaceful landscape. Sense of wilderness.	Major infrastructure (transport, utilities, industry). Large concentrations of residential, commercial, industrial development. Character affected by urban development. Noisy, settled landscapes. Modern and developed landscapes with signs of human activity.
Condition / intactness	Intact landscapes with natural or historic features in good condition.	Degraded landscapes (likely to have evidence of human influences / modern intensive farming practices). • Degraded / intermittent boundary treatments.
Historic features and cultural heritage	Ancient / historic field patterns. Important, distinctive or remnant features of the landscape. Cultural associations with a particular landscape.	Modern / developed landscape with limited historic features.
Scenic quality and character	High scenic quality. Strong sense of place.	Low scenic quality. Weak sense of place.

7.6.26 The susceptibility to change for each landscape receptor will be categorised with reference to the criteria in Table 7-10 below.

Table 7-10: Landscape Susceptibility Criteria

Landscape susceptibility	Typical description
Very high	The type of change arising from the specific proposal are very likely to lead to undue consequences for the maintenance of the baseline situation and/or the achievement of landscape planning policies and strategies.
High	The type of change arising from the specific proposal are likely to lead to undue consequences for the maintenance of the baseline situation and/or the achievement of landscape planning policies and strategies.
Medium	The type of change arising from the specific proposal may lead to undue consequences for the maintenance of the baseline situation and/or the achievement of landscape planning policies and strategies.
Low	The type of change arising from the specific proposal are unlikely to lead to undue consequences for the maintenance of the baseline situation and/or the achievement of landscape planning policies and strategies.
Very low	The type of change arising from the specific proposal are very unlikely to lead to undue consequences for the maintenance of the baseline situation and/or the achievement of landscape planning policies and strategies.

Combining judgements to define landscape sensitivity

- 7.6.27 The sensitivity of each LCA has been defined by combining professional judgements on the value attached to the landscape and its susceptibility to change and is supported by a clear narrative. Reference has been made to the criteria set out in Table 7-11 to Table 7-13 below.

Table 7-11: Sensitivity of Landscape Receptors Criteria

Sensitivity	Typical description
Very high	Landscapes with statutory status or national policy protection with very limited ability to accommodate the type of change without undue consequences for the maintenance of the baseline situation and/or the achievement of landscape planning policies and strategies.
High	Landscapes which may be locally designated or otherwise supported by a detailed evidence base or landscape with other strong indicators of value with limited ability to accommodate the type of change without undue consequences for the maintenance of the baseline situation and/or the achievement of landscape planning policies and strategies.
Medium	Landscapes which are unlikely to be a designated for landscape quality but may exhibit some indicators of value and which may have some ability to accommodate the type of change without undue consequences for the maintenance of the baseline situation and/or the achievement of landscape planning policies and strategies.
Low	Not designated for landscape quality and likely to exhibit few indicators of value and likely to accommodate the type of change no or limited

Sensitivity	Typical description
	undue consequences for the maintenance of the baseline situation and/or the achievement of landscape planning policies and strategies.
Very low	Landscapes of very low value able to accommodate the type of change without undue consequences for the maintenance of the baseline situation and/or the achievement of landscape planning policies and strategies.

Magnitude of landscape impacts

7.6.28 Paragraph 3.28 of GLVIA3 notes that the magnitude is informed by combining considerations relating to the “scale, extent and duration” of impacts. LI TGN 01/24 suggests that the size/scale of impacts is likely be the most important factor (3(3)). In point 5(11) it goes on to state that geographical extent should reflect the relevance of the location and that the spread of effects should be used as a ‘modifier’ to the scale of effect so that it does not understate the magnitude of effects for extensive receptors such as large character areas or designations. This is the approach that will be taken in this assessment. In summarising the magnitude of landscape impacts, reference will be made to the following:

- *Size or scale* - the degree to which key characteristics or features identified in the baseline would change, the proportion of the total extent that this represents and the contribution of that element to the character of the landscape. It will also be influenced by the degree to which aesthetic or perceptual aspects of the landscape would be altered and whether this would change the key characteristics of the landscape;
- *Geographical extent* – the area over which the change would occur. For example, whether the effects of the Proposed Development are perceived over a large or very localised area;
- *Duration* – the time over which the change would occur, set out on the following scale: short term (0-5 years), medium term (5-15 years), or long term (over 15 years); and
- *Reversibility* - related to whether the change can be reversed and is reported as reversible, partially reversible or permanent, e.g. effects arising from presence of construction traffic will cease at the end of construction and therefore is considered to be fully reversible, whereas effects arising from presence of new built above and below ground development could be partially reversible (depending on construction approach and ground surface finishes for below ground infrastructure) or permanent.

7.6.29 The criteria set out in Table 7-12 to Table 7-14 will be referred to in determining the magnitude of landscape impacts.

Table 7-12: Magnitude of Landscape Impacts Criteria

Magnitude of impact	Typical description
Very high	Substantial changes to key characteristics across most of the area or to unique and distinctive features at a local level. May be longer term impacts, and are more likely to be permanent than reversible
High	Changes to the character of the landscape across large parts of the area or to distinctive features at a local level. May be longer term impacts, permanent or reversible
Medium	Changes to the character of the landscape across parts of the area or to some existing features at a local level. May be medium term impacts, permanent or reversible.
Low	Slight change to landscape character or landscape features across a small area. May be short to medium term impacts and are more likely to be reversible than permanent.
Very low	Barely perceptible change to the landscape receptor or may impact a limited area or no key characteristics. May be short term impacts, permanent or reversible.

- 7.6.30 There may be cases where there will be no impacts on a receptor, for example where the design has been changed to avoid such impacts. In such cases this will be recorded as no change.

Assessment of visual effects

- 7.6.31 As outlined in Section 7.2, Computer-generated ZTV will be prepared to support the assessment. Bare earth ZTVs have already been prepared to inform the worst-case scenario for the baseline. Further ZTVs will be prepared at the next stage of the assessment that include existing surface features. These ZTVs will provide some understanding of potential screening or filtering of views of the Proposed Development and will be further verified through fieldwork.

Visual receptors and representative viewpoints

- 7.6.32 Visual receptors are defined in GLVIA3 as “individuals and/or defined groups of people who have the potential to be affected by a proposal”. Visual receptors likely to experience views of the Proposed Development will be identified through interrogation of the ZTV, desktop analysis of maps and fieldwork surveys. They will subsequently be categorised into the following types:
- Residents of local communities;
 - People working in the area;
 - People travelling through the area; and
 - People using parks and open spaces.
- 7.6.33 Where a collection of visual receptors in the same category are likely to experience similar views, they will be grouped. Representative viewpoints will be identified within the ZTV to assist in describing the baseline view and the effects likely to be experienced by visual receptor groups. These representative viewpoints will be selected to cover a range of viewing distances, elevations and orientations from locations with different viewing experiences of the Proposed Development, and the Applicant will seek to agree these with relevant local planning authorities. The selection of representative viewpoints will be informed by the following criteria:

- Accessibility to the public;
- Number and sensitivity of people whose views can be affected;
- Viewing direction, distance, openness and elevation; and
- Nature of the viewing experience.

7.6.34 Photographs taken during fieldwork surveys will be provided in the ES to help demonstrate the nature of baseline views including the extent of existing screening. These photographs will be presented as Type 1 annotated photographs.

7.6.35 Type 4 photomontages will also be provided for a selection of viewpoints to illustrate the likely extent and nature of changes in baseline views in winter (year 1 of operation) and summer (year 15 of operation). All photographs and photomontages have been prepared in accordance with Landscape Institute TGN 06/19 (Ref 7-48).

7.6.36 The Landscape Institute clarified the extent to which the views of residents fall within the scope of LVIA in 6(1) of LI TGN 01/24. It explains that views from houses and individual properties are a matter of private amenity, noting that it is an established planning principle that there is no right to a view. It states that *“LVIA should consider views from local communities focusing on the way that a community currently experiences views from public locations such as streets and open spaces and how those will change”* and that *“it may be helpful for an LVIA to comment on changes to views that will be experienced from groups of properties, or in some cases individual properties, if these changes are likely to be significant.”* Therefore, if the LVIA identifies the likelihood of residual effects on visual receptors which would be major adverse (the highest level of significance) at year 15 of operation (i.e. after the establishment of proposed planting and in summer) a Residential Visual Amenity Assessment (RVAA) will be carried out.

Sensitivity of visual receptors

7.6.37 Paragraph 6.31 of GLVIA3 states that each visual receptor should be assessed in terms of both their susceptibility to change in views and visual amenity and also the value attached to particular views. The sensitivity of visual receptors results from a combination of parameters, such as:

- The activity/occupation/ pastime of the receptors at particular locations;
- The extent to which their attention or interest may be focused on the views; and
- The visual amenity they experience.

7.6.38 Consideration will also be given to the:

- Location, focus and orientation;
- Features or characteristics of value within the view;
- Principal or secondary interests;
- Static or kinetic nature of views; and
- Duration of the view.

Value attached to views

7.6.39 A three-stage process will be used to determine the value attached to views. This relates to the features and characteristics of the baseline landscape within the view and other indicators of value, for example reference in policy, guidebooks, literature or art.

- *Stage 1:* identify if the view or the landscape within the view is covered by any relevant policy or designations and note features and characteristics of value with reference to the landscape baseline;
- *Stage 2:* identify if the view is identified on maps, is likely to be from a popular visitor location or has historical or cultural importance or associations; and
- *Stage 3:* Determine the value attached to the view with reference to the criteria provided in Table 7-13 using the evidence from Stages 1 and 2.

Table 7-13: Value Attached to the Views Criteria

Value	Typical description
Very high	Views within or across a nationally or internationally designated landscapes and/or specific views designated in national or regional policy. Views are likely to have few or no detracting features and which may also have strong cultural associations supported by evidence, which could include links to historical events or people, representation in art or literature, for example.
High	Views within or across regionally or locally designated landscapes, other or landscapes with strong indicators of value, or views identified in the development plan or evidence base. Views are likely to have few or no detracting features and may also have some cultural associations supported by strong evidence.
Medium	Views across landscapes which are unlikely to be designated but may exhibit some indicators of value which are identified in the development plan or evidence base and are important at the community level. Views may have some detracting features and cultural associations supported by evidence.
Low	Views across landscapes which are not designated for landscape quality and likely to exhibit few indicators of value which are identified in the development plan or evidence base. Views are likely to have some detracting features and lack cultural associations supported by evidence.
Very low	View across landscapes which are neither designated, nor identified in the development plan or evidence base, and without cultural associations. The landscape in the view is in poor condition or notably detracts from the experience of the view.

Susceptibility of visual receptors to change

7.6.40 The sensitivity of visual receptors is also dependent upon their susceptibility to changes in views and the visual amenity they experience. Paragraph 6.32 of GLVIA3 explains that *“the susceptibility of different visual receptors to changes in views and visual amenity is mainly a function of:*

- *The occupation or activity of people experiencing the view at particular locations; and*
- *The extent to which their attention or interest may therefore be focussed on the views and the visual amenity they experience at particular locations.”*

- 7.6.41 GLVIA3 notes that visual receptors “*most susceptible to change*”, include residents and visitors engaged in outdoor recreation “*whose attention or interest is likely to be focused on the landscape and on particular views*” (para 6.33).
- 7.6.42 Table 7-14 sets out the criteria referred to in determining the susceptibility of visual receptors to the Proposed Development.

Table 7-14: Susceptibility of Visual Receptors Criteria

Susceptibility	Typical description
Very high	Visitors to nationally or internationally designated landscapes, particularly at specific viewpoints or viewing places, where views of the landscape are fundamental to the experience. People engaged in specific activities for enjoyment of dark skies.
High	Residents at home. Visitors to tourist hotspots, heritage assets or other attractions outside of nationally or internationally designated landscapes, particularly at specific viewpoints or viewing places, where views of the landscape are important to the experience. People engaged in outdoor recreation whose attention or interest is likely to be focussed on the landscape and on particular views, for example those using promoted walking and cycling routes. People travelling along promoted scenic routes.
Medium	People engaged in outdoor recreation or travelling along public rights of way or local roads, which are not promoted routes but where an appreciation of the surrounding landscape are relevant to the experience. People working outdoors.
Low	People engaged in outdoor sport or recreation which does not involve or depend upon appreciation of views of the landscape People travelling on major road, rail or other transport routes which are not recognised as scenic routes.
Very low	People working indoors.

Sensitivity of visual receptors

- 7.6.43 The sensitivity of visual receptors is based on professional judgement and will be informed by the criteria in Table 7-15, considering the value attached to views and susceptibility of visual receptors to the changes proposed.

Table 7-15: Sensitivity of Visual Receptors Criteria

Sensitivity	Typical description
Very high	Activity where views are fundamental to the experience and are related to landscapes with national or international designation and with few or no detracting features and which may also have strong cultural associations supported by evidence.
High	Activity resulting in a particular interest or appreciation of the view and/or views within or across regionally or locally designated

Sensitivity	Typical description
	landscapes, other or landscapes with strong indicators of value, or views identified in the development plan or evidence base with few or no detracting features and may also have some cultural associations supported by strong evidence.
Medium	Activity resulting in a general interest or appreciation of the and/or a view, likely to exhibit some indicators of value which are identified in the development plan or evidence base and are important at the community level.
Low	Activity where interest or appreciation of the view is secondary to the activity or the period of exposure to the view is limited, and/or views across landscapes which are not designated for landscape quality and likely to exhibit few indicators of value and likely to have some detracting features and lack cultural associations supported by evidence.
Very low	Activity where interest or appreciation of the view is inconsequential to their activity, and/or across landscapes which are neither designated, nor recognised in policy, and without cultural associations or is in poor condition or notably detracts from the experience of the view.

Magnitude of visual impacts

- 7.6.44 The magnitude of visual impacts relates to the extent to which the baseline view would change as a result of the Proposed Development. This assessment has been made with reference to fieldwork observations, photographs and photomontages where relevant from the representative viewpoints identified.
- 7.6.45 Paragraph 3.28 of GLVIA3 notes that magnitude is informed by combining considerations relating to the “*scale, extent and duration*” of impacts. This includes the geographical extent of influence, the spatial extent of the impact, the level of integration of new features with existing elements, its duration and degree to which the impact is reversible.
- 7.6.46 Reference will be made to the following in summarising the magnitude of visual impacts:
- *Size and scale* – loss of existing features or addition and integration of new features and the time over which it will be experienced and whether views will be full, partial or glimpsed.
 - *Geographical extent* – the angle of view in relation to the main activity of the receptor, the distance of the viewpoint from the Proposed Development and the extent of the area over which the changes would be visible, including whether views are fixed or sequential.
 - *Duration and reversibility* – the time over which the change would occur, set out on the following scale: short term (0-5 years), medium term (5-15 years), or long term (over 15 years).
- 7.6.47 LI TGN 01/24 suggests that the size/scale of impacts is likely be the most important factor (3(3)). In point 5(11) it goes on to suggest that geographical extent should reflect the relevance of the location and that the spread of effects should be used as a ‘modifier’ to the scale of effect so that it does not understate the magnitude of effects for extensive receptors such as large character areas or designations. This is the approach that will be taken in this assessment.
- 7.6.48 The magnitude of visual impact is defined by combining judgements on size or scale, geographical extent, duration and reversibility, with reference to Table 7-16 based on guidance from GLVIA3.

Table 7-16: Magnitude of Visual Impacts Criteria

Magnitude of impact	Typical description
Very high	The Proposed Development will result in extensive changes to the character and composition and will become the dominant feature of the landscape within the view. There may be longer term impacts, permanent or reversible.
High	The Proposed Development will change the character and composition of large parts of the landscape within the view. There may be longer term impacts, permanent or reversible.
Medium	The Proposed Development will change the character and composition of discrete parts of the landscape within the view. There may be medium term impacts, permanent or reversible.
Low	The Proposed Development will cause small changes to the character and composition of the landscape within the view. There may be short to medium term impacts, permanent or reversible.
Very low	The development will cause barely perceptible changes in the character and composition of the landscape within view. May be short term impacts, permanent or reversible.

7.6.49 There may be cases where there will be no impacts on a receptor, for example where the design has been changed to avoid such impacts. In such cases this will be recorded as no change.

Significance of landscape and visual effects

7.6.50 The approach to determining the level of landscape and visual effects and whether these effects are considered significant in EIA terms will be the same. There are important distinctions between these two terms:

- The level of effect combines judgements on the sensitivity of each receptor and the magnitude of impact, made with reference to the matrix set out in Table 7-17 below.
- Significant effects are those which are considered most important in the decision-making process. An effect in this LVIA is considered significant in EIA terms if it is of major or moderate significance. All other effects will be categorised as not significant.

7.6.51 As noted in 3(6) of LI TGN 01/24, LVIA is a means of documenting professional judgement, rather than a formulaic process. Table 7-17 will be used to guide judgements on the relationship between the sensitivity of a visual receptor, the magnitude of impact and the resulting level of effect. Where conclusions differ from this guide, a reasoned explanation will be provided in the assessment text.

Table 7-17: Significance of Landscape and Visual Effects

Sensitivity		Magnitude of impact				
		Very high	High	Medium	Low	Very Low
	Very high	Major	Major	Major or Moderate	Moderate	Moderate or Minor
	High	Major	Major or Moderate	Moderate	Moderate or Minor	Minor
	Medium	Major or Moderate	Moderate	Moderate or Minor	Minor	Minor or Negligible
	Low	Moderate	Moderate or Minor	Minor	Minor or Negligible	Negligible
	Very low	Moderate or Minor	Minor	Minor or Negligible	Negligible	Negligible

- 7.6.52 The identification of the likely significant effects on landscape and visual receptors will rely on detailed analysis and the professional judgement of competent experts, and consultation with stakeholders. Point 3(7) of LI TGN 01/24 states that *“the level of effect and whether it will have a positive or negative (or neutral) consequence are independent of each other”*. Whether effects are adverse, beneficial or neutral will be determined by considering the way in which the changes are likely to affect the baseline:
- 7.6.53 Adverse effects are likely to occur where the Proposed Development introduces new elements or changes which are discordant or intrusive resulting in a deterioration to existing character or valued features of the landscape or of views and visual amenity.
- 7.6.54 Beneficial effects are likely to occur where the proposed development enhances the character of the landscape or existing views.
- 7.6.55 Neutral will be used to describe a categorisation of effect. Paragraphs 5.37 and 6.29 of GLVIA3 state that it is possible for effects to be neutral in their consequences for landscape and for visual receptors. Where a judgement of neutral effects has been reached, reference will be made to the contribution of the Proposed Development to the baseline and acknowledging the positive and negative aspects which have been considered.
- 7.6.56 Where the assessment has concluded that there will be no impacts on a receptor, this will be reported as no effect. This may, for example, be a consequence of changes to the design which has avoided impacts on receptors identified at the scoping stage.
- 7.6.57 Residual effects will be those which remain even with embedded or primary mitigation at construction and year 15 of existence and operation and which cannot be further mitigated by design or other measures in this time period.

Consultation

- 7.6.58 Engagement in addition to formal consultation will be held with relevant LPAs and statutory consultees early in the LVIA process. This will help to inform detailed baseline survey and data collection; refinement of the location of representative viewpoints that will form the basis of the visual assessment; and, to agree the approach to mitigation measures and landscape reinstatement.

Assumptions and limitations

- 7.6.59 All fieldwork will be undertaken from publicly accessible locations. Professional judgement will be used to consider residents' views, aided by aerial photography and fieldwork observations.
- 7.6.60 For the construction phase assessment, the assumptions are that construction activity will be undertaken across the whole site at the same time and during winter. This assumes that existing deciduous vegetation is not in leaf, thereby representing a worst-case assessment scenario.
- 7.6.61 For the assessment of effects at year 15 of operation, the assumption is that all new planting would have successfully established, having increased in height by 4.5 m since year 1 of operation (i.e. 30 cm of growth per year).
- 7.6.62 The assessment will be based on the maximum parameters of the Proposed Development, taking account of embedded mitigation and design principles, to represent a reasonable worst-case.

7.7 Planned Surveys

- 7.7.1 Field surveys will be undertaken in winter and summer to test the assumptions made through the desk study. This will assist in describing existing features including landform, built development and vegetation which limit potential landscape and visual interactions with the Proposed Development. Draft photography will be captured during initial fieldwork to refine the location and field of view relating to representative viewpoints. Panoramic photography will then be captured in winter and summer for each representative viewpoint.
- 7.7.2 All locations visited during the surveys will be publicly accessible locations. Professional judgement will be used to assess residents' views, aided by aerial photography and fieldwork observations.

7.8 Mitigation

- 7.8.1 The LVIA will be key to achieving the criteria for good design set out in section 4.7 of the NPS EN-1 and this has been a key consideration from the outset. The Proposed Development is being designed with regard to a design vision and a set of design principles, informed by the LVIA. These are currently under development and will be summarised in the PEIR and ES.
- 7.8.2 The most effective mitigation for adverse landscape and visual effects is to avoid impacts at source as part of the design process, for example through the siting of infrastructure. This has been considered as part of the optioneering process. Where effects cannot be avoided, the hierarchy is that impacts should be minimised, rectified, reduced or finally offset. All landscape mitigation is therefore considered embedded and additional. This will be supported by a comprehensive reinstatement strategy and appropriate management measures for landscape and ecology. Beneficial effects will be maximised wherever practicable, for example through the design of multi-functional green infrastructure which provides a range of ecosystem services to deliver environmental net gain.
- 7.8.3 Mitigation principles to avoid or minimise potential construction effects will focus on reducing the duration and footprint of construction activity, locating development in the least prominent positions and wherever practicable maximising the distance from nearby visual receptors. Other measures which will be considered include positioning the works to make use of existing natural features such as landform and vegetation to screen views.
- 7.8.4 The Proposed Development will be designed to avoid or minimise the loss of existing landscape features of value, such as trees, woodland, and hedgerows wherever practicable. Any loss will be mitigated with replacement planting as close to the location, type and character of the existing

vegetation to reduce effects resulting from such losses. The design will also identify opportunities for landscape restoration and enhancement, by introducing planting which repairs or reinforces existing vegetation patterns and contributes to biodiversity net gain.

- 7.8.5 The LVIA will inform the iterative design process of the Proposed Development, specifically with regards to the siting, layout and colour tones of the Capture Facilities and above ground structures associated with the Peak Cluster and Coastal AGI to MLWS pipelines to reduce their visibility and perceived scale and mass within the landscape, as well as identifying mitigation to reduce landscape and visual effects. The LVIA can also be used to inform the identification of opportunities for new green infrastructure such as new habitats.
- 7.8.6 The Applicant will set out the design vision, objectives, functions, principles and inter-relationships between different environmental elements as part of a design principles document for the ES stage. Information will be included to explain how these elements will be designed to integrate with the wider nature network, through the detailed design and how they will be implemented, maintained and monitored. This will include consideration of siting relative to existing landscape character, landform and vegetation, as set out in paragraph 4.7.6 of NPS EN-1. The type, extent and functions of the proposed mitigation will be illustrated on plans which will accompany the DCO application.
- 7.8.7 The relevant landscape and visual mitigation and enhancements, and how the LVIA has informed the design process to minimise negative effects, will be summarised in the ES.

7.9 Summary

- 7.9.1 The LVIA will be undertaken with reference to current best practice guidance, including GLVIA3 and subsequent clarifications.
- 7.9.2 The landscape assessment will consider potential effects on recognised national and local landscape character areas and landscape designations.
- 7.9.3 The visual assessment will be informed by representative viewpoints, which will be identified through baseline studies and defined in consultation with statutory consultees.
- 7.9.4 Mitigation measures will also be developed and informed by the detailed baseline and assessment stages and will seek to minimise potential adverse effects. This will focus on the reinstatement of the onshore pipeline corridor and integrating the Capture Facilities, AGI and BVS, and Coastal AGI into the landscape and views.
- 7.9.5 As there is the potential for long term landscape and visual effects associated with the Capture Facilities, AGI and BVS, and Coastal AGI, the LVIA will be included within the ES.
- 7.9.6 A summary of the issues to be scoped in or out of the landscape and visual assessment is presented in Table 7-18 to Table 7-24.

Table 7-18: Landscape and Visual Scope - Capture Facilities (Breedon Capture Facility, Tarmac Capture Facility, Buxton Lime Capture Facility, Holcim Capture Facility)

Landscape and Visual Scope – Capture Facilities				
Scope Scoped in ✓, scoped out ✗	Construction (C), Operation (O), Decommissioning (D)			Rationale
	C	O	D	
Temporary effects to landscape character	✓	✗	✓	Whilst the works would occur within the existing operational boundary limiting the effects on the physical fabric of the landscape, it is anticipated that significant effects to perceptual and experiential elements of landscape character have the potential to occur.
Long term effects on landscape character	✗	✓	✗	As above
Temporary effects on the LCA within the LVIA Study Area	✓	✗	✓	As above
Long term effects on the LCA within the LVIA Study Area	✗	✓	✗	As above
Temporary effects on the statutory purposes and special landscape qualities of the PDNP and its setting	✓	✗	✓	Based upon the proximity to the PDNP and its setting it is anticipated that significant effects to perceptual and experiential elements of landscape character have the potential to occur.

Landscape and Visual Scope – Capture Facilities				
Permanent effects on the statutory purposed and special landscape qualities of the PDNP and its setting	✗	✓	✗	As above
Temporary disruption to people's views and visual amenity as a result of construction of the Proposed Development	✓	✗	✓	Based upon the size and scale of the construction works it is anticipated that significant effects to views have the potential to occur.
Long term effects to people's views and visual amenity as a result of the existence and operation of the Proposed Development	✗	✓	✗	Based upon the size and scale of operational infrastructure it is anticipated that significant effects to views have the potential to occur.

Table 7-19: Landscape and Visual Scope – Above Ground Infrastructure (North Feeder AGI)

Landscape and Visual Scope – Above Ground Infrastructure (North Feeder AGI)				
Scope Scoped in ✓, scoped out ✗	Construction (C), Operation (O), Decommissioning (D)			Rationale
	C	O	D	
Temporary effects to landscape character	✓	✗	✓	Based upon the size and scale of the works it is anticipated that significant effects to the physical fabric, perceptual and experiential elements of landscape character have the potential to occur.
Long term effects on landscape character	✗	✓	✗	As above
Temporary effects on the LCA within the LVIA Study Area	✓	✗	✓	As above
Long term effects on the LCA within the LVIA Study Area	✗	✓	✗	As above
Temporary effects on the statutory purposes and special landscape qualities of the PDNP and its setting	✓	✗	✓	Based upon the proximity to the PDNP and its setting it is anticipated that significant effects to perceptual and experiential elements of landscape character have the potential to occur.

Landscape and Visual Scope – Above Ground Infrastructure (North Feeder AGI)				
Permanent effects on the statutory purposed and special landscape qualities of the PDNP and its setting	✗	✓	✗	As above
Temporary disruption to people's views and visual amenity as a result of construction of the Proposed Development	✓	✗	✓	Based upon the size and scale of the construction works it is anticipated that significant effects to views have the potential to occur.
Long term effects to people's views and visual amenity as a result of the existence and operation of the Proposed Development	✗	✓	✗	Based upon the size and scale of operational infrastructure it is anticipated that significant effects to views have the potential to occur.
Temporary effects associated with lighting.	✓	✗	✓	Based upon the size and scale of the construction works it is anticipated that significant effects to views have the potential to occur.
Long term effects associated with lighting	✗	✗	✗	Long term affects associated with lighting are likely to result in no change to the existing baseline and it is anticipated that significant effects are unlikely to occur.

Table 7-20: Landscape and Visual Scope – Above Ground Infrastructure (Central Feeder AGI, Connection AGI 1 and Connection AGI 2 and AGI 3)

Landscape and Visual Scope – Above Ground Infrastructure (Central Feeder AGI, Connection AGI 1, Connection AGI 2 and AGI 3)				
Scope Scoped in ✓, scoped out ✗	Construction (C), Operation (O), Decommissioning (D)			Rationale
	C	O	D	
Temporary effects to landscape character	✓	✗	✓	Based upon the size and scale of the works it is anticipated that significant effects to the physical fabric, perceptual and experiential elements of landscape character have the potential to occur.
Long term effects on landscape character	✗	✓	✗	As above
Temporary effects on the LCA within the LVIA Study Area	✓	✗	✓	As above
Long term effects on the LCA within the LVIA Study Area	✗	✓	✗	As above
Temporary effects on the statutory purposes and special landscape qualities of the PDNP and its setting	✗	✗	✗	Based upon the distance from the PDNP and its setting it is anticipated that significant effects are unlikely to occur.

Landscape and Visual Scope – Above Ground Infrastructure (Central Feeder AGI, Connection AGI 1, Connection AGI 2 and AGI 3)				
Permanent effects on the statutory purposed and special landscape qualities of the PDNP and its setting	x	x	x	As above
Temporary disruption to people's views and visual amenity as a result of construction of the Proposed Development	✓	x	✓	Based upon the size and scale of the construction works it is anticipated that significant effects to views have the potential to occur.
Long term effects to people's views and visual amenity as a result of the existence and operation of the Proposed Development	x	✓	x	Based upon the size and scale of operational infrastructure it is anticipated that significant effects to views have the potential to occur.
Temporary effects associated with lighting	✓	x	✓	Based upon the size and scale of the construction works it is anticipated that significant effects to views have the potential to occur.
Long term effects associated with lighting	x	x	x	Long term affects associated with lighting are likely to result in no change to the existing baseline and it is anticipated that significant effects are unlikely to occur.

Table 7-21: Landscape and Visual Scope – Peak Cluster Pipeline (Central)

Landscape and Visual Scope – Peak Cluster Pipeline (Central)				
Scope Scoped in ✓, scoped out ✗	Construction(C), Operation (O), Decommissioning (D)			Rationale
	C	O	D	
Temporary effects to landscape character	✓	✗	✗	Based upon the size, scale, and geographical extent of the construction works it is anticipated that significant effects to the physical fabric, perceptual and experiential elements of landscape character have the potential to occur during construction. As the pipeline would remain buried at decommissioning, it is anticipated that significant effects are unlikely to occur.
Long term effects on landscape character	✗	✗	✗	As the pipeline is to be buried, with the landscape being returned to the existing baseline, it is anticipated that significant effects are unlikely to occur.
Temporary effects on the LCA within the LVIA Study Area	✓	✗	✗	Based upon the size, scale, and geographical extent of the construction works it is anticipated that significant effects to the physical fabric, perceptual and experiential elements of landscape character have the potential to occur.
Long term effects on the LCA within the LVIA Study Area	✗	✗	✗	As the pipeline is to be buried, with the landscape being returned to the existing baseline, it is anticipated that significant effects are unlikely to occur.
Temporary effects on the statutory purposes and special landscape qualities of the PDNP and its setting	✗	✗	✗	Based upon the distance from the PDNP and its setting it is anticipated that significant effects are unlikely to occur.

Landscape and Visual Scope – Peak Cluster Pipeline (Central)				
Permanent effects on the statutory purposed and special landscape qualities of the PDNP and its setting	x	x	x	As above
Temporary disruption to people's views and visual amenity as a result of construction of the Proposed Development	✓	x	x	Based upon the size and scale of the construction works it is anticipated that significant effects to views have the potential to occur.
Long term effects to people's views and visual amenity as a result of the existence and operation of the Proposed Development	x	x	x	Based upon the size and scale of operational infrastructure it is anticipated that significant effects to views have the potential to occur.
Temporary effects associated with lighting	✓	x	x	Based upon the size and scale of the construction works it is anticipated that significant effects to views have the potential to occur.
Long term effects associated with lighting	x	x	x	Long term affects associated with lighting are likely to result in no change to the existing baseline and it is anticipated that significant effects are unlikely to occur.

Table 7-22: Landscape and Visual Scope – Peak Cluster Pipeline (East)

Landscape and Visual Scope – Peak Cluster Pipeline (East)				
Scope Scoped in ✓, scoped out ✗	Construction (C), Operation (O), Decommissioning (D)			Rationale
	C	O	D	
Temporary effects to landscape character	✓	✗	✗	Based upon the size, scale, and geographical extent of the construction works it is anticipated that significant effects to the physical fabric, perceptual and experiential elements of landscape character have the potential to occur during construction. As the pipeline would remain buried at decommissioning, it is anticipated that significant effects are unlikely to occur.
Long term effects on landscape character	✗	✗	✗	As the pipeline is to be buried, with the landscape being returned to the existing baseline, it is anticipated that significant effects are unlikely to occur.
Temporary effects on the LCA within the LVIA Study Area	✓	✗	✗	Based upon the size, scale, and geographical extent of the construction works it is anticipated that significant effects to the physical fabric, perceptual and experiential elements of landscape character have the potential to occur.
Long term effects on the LCA within the LVIA Study Area	✗	✗	✗	As the pipeline is to be buried, with the landscape being returned to the existing baseline, it is anticipated that significant effects are unlikely to occur.
Temporary effects on the statutory purposes and special landscape qualities of the PDNP and its setting	✗	✗	✗	Based upon the distance from the PDNP and its setting it is anticipated that significant effects are unlikely to occur.

Landscape and Visual Scope – Peak Cluster Pipeline (East)				
Permanent effects on the statutory purposed and special landscape qualities of the PDNP and its setting	x	x	x	As above
Temporary disruption to people's views and visual amenity as a result of construction of the Proposed Development	✓	x	x	Based upon the size and scale of the construction works it is anticipated that significant effects to views have the potential to occur.
Long term effects to people's views and visual amenity as a result of the existence and operation of the Proposed Development	x	x	x	As the pipeline is to be buried, with the landscape being returned to the existing baseline, it is anticipated that significant effects are unlikely to occur.
Temporary effects associated with lighting	✓	x	x	Based upon the size and scale of the construction works it is anticipated that significant effects to views have the potential to occur.
Long term effects associated with lighting	x	x	x	Long term affects associated with lighting are likely to result in no change to the existing baseline and it is anticipated that significant effects are unlikely to occur.

Table 7-23: Landscape and Visual Scope - Peak Cluster Pipeline (West) and Coastal AGI to MLWS Pipeline(s)

Landscape and Visual Scope – Peak Cluster Pipeline (West) and Coastal AGI to MLWS Pipeline				
Scope Scoped in ✓, scoped out ✗	Construction (C), Operation (O), Decommissioning (D)			Rationale
	C	O	D	
Temporary effects to landscape character	✓	✗	✗	Based upon the size, scale, and geographical extent of the construction works it is anticipated that significant effects to the physical fabric, perceptual and experiential elements of landscape character have the potential to occur during construction. As the pipeline would remain buried at decommissioning, it is anticipated that significant effects are unlikely to occur.
Long term effects on landscape character	✗	✗	✗	As the pipeline is to be buried, with the landscape being returned to the existing baseline, it is anticipated that significant effects are unlikely to occur.
Temporary effects on the LCA within the LVIA Study Area	✓	✗	✗	Based upon the size, scale, and geographical extent of the construction works it is anticipated that significant effects to the physical fabric, perceptual and experiential elements of landscape character have the potential to occur.
Long term effects on the LCA within the LVIA Study Area	✗	✗	✗	As the pipeline is to be buried, with the landscape being returned to the existing baseline, it is anticipated that significant effects are unlikely to occur.
Temporary effects on the statutory purposes and special landscape qualities of the PDNP and its setting	✗	✗	✗	Based upon the distance from the PDNP and its setting it is anticipated that significant effects are unlikely to occur.

Landscape and Visual Scope – Peak Cluster Pipeline (West) and Coastal AGI to MLWS Pipeline				
Permanent effects on the statutory purposed and special landscape qualities of the PDNP and its setting	x	x	x	As above
Temporary effects on the special landscape qualities of the Clwydian Range and Dee Valley National Landscape and its setting	x	x	x	Based upon the distance from the Clwydian Range and Dee Valley National Landscape and its setting it is anticipated that significant effects are unlikely to occur.
Long term effects on the special landscape qualities of the Clwydian Range and Dee Valley National Landscape and its setting	x	x	x	As above
Temporary disruption to people's views and visual amenity as a result of construction of the Proposed Development	✓	x	x	Based upon the size and scale of the construction works it is anticipated that significant effects to views have the potential to occur.
Long term effects to people's views and visual amenity as a result of the existence and operation of the Proposed Development	x	x	x	As the pipeline is to be buried, with the landscape being returned to the existing baseline, it is anticipated that significant effects are unlikely to occur.
Temporary effects associated with lighting	✓	x	x	Based upon the size and scale of the construction works it is anticipated that significant effects to views have the potential to occur.

Landscape and Visual Scope – Peak Cluster Pipeline (West) and Coastal AGI to MLWS Pipeline				
Long term effects associated with lighting	✗	✗	✗	Long term effects associated with lighting are likely to result in no change to the existing baseline and it is anticipated that significant effects are unlikely to occur.

Table 7-24: Landscape and Visual Scope – Coastal AGI

Landscape and Visual Scope – Coastal AGI				
Scope Scoped in ✓, scoped out ✗	Construction (C), Operation (O), Decommissioning (D)			Rationale
	C	O	D	
Temporary effects to landscape character	✓	✗	✓	Based upon the size and scale of the works it is anticipated that significant effects to the physical fabric, perceptual and experiential elements of landscape character have the potential to occur.
Long term effects on landscape character	✗	✓	✗	As above
Temporary effects on the LCA within the LVIA Study Area	✓	✗	✓	As above
Long term effects on the LCA within the LVIA Study Area	✗	✓	✗	As above

Landscape and Visual Scope – Coastal AGI				
Temporary effects on the statutory purposes and special landscape qualities of the PDNP and its setting	x	x	x	Based upon the distance from the PDNP and its setting it is anticipated that significant effects are unlikely to occur.
Permanent effects on the statutory purposed and special landscape qualities of the PDNP and its setting	x	x	x	As above
Temporary effects on the special landscape qualities of the Clwydian Range and Dee Valley National Landscape and its setting	x	x	x	Based upon the distance from the Clwydian Range and Dee Valley National Landscape and its setting it is anticipated that significant effects are unlikely to occur.
Long term effects on the special landscape qualities of the Clwydian Range and Dee Valley National Landscape and its setting	x	x	x	As above
Temporary disruption to people's views and visual amenity as a result of construction of the Proposed Development	✓	x	✓	Based upon the size and scale of the construction works it is anticipated that significant effects to views have the potential to occur.
Long term effects to people's views and visual amenity as a result of the existence and operation of the Proposed Development	x	✓	x	Based upon the size and scale of operational infrastructure it is anticipated that significant effects to views have the potential to occur.

Landscape and Visual Scope – Coastal AGI				
Temporary effects associated with lighting	✓	✗	✗	Based upon the size and scale of the construction works it is anticipated that significant effects to views have the potential to occur.
Long term effects associated with lighting	✗	✗	✗	Long term affects associated with lighting are likely to result in no change to the existing baseline and it is anticipated that significant effects are unlikely to occur.

7.10 References

- Ref 7-1** Council of Europe (2016). Council of Europe Landscape Convention. Available at: <https://www.coe.int/en/web/landscape/home>
- Ref 7-2** HM Government (2021). The Environment Act 2021. Available at: <https://www.legislation.gov.uk/ukpga/2021/30>
- Ref 7-3** HM Government (2017). The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017. Available at: <https://www.legislation.gov.uk/uksi/2017/572>
- Ref 7-4** HM Government (2023). The Energy Act 2023. Available at: <https://www.legislation.gov.uk/ukpga/2023/52>
- Ref 7-5** HM Government (1949). National Parks and Access to the Countryside Act 1949. Available at: <https://www.legislation.gov.uk/ukpga/Geo6/12-13-14/97>
- Ref 7-6** HM Government (2000). The Countryside and Rights of Way (CROW) Act 2000. Available at: <https://www.legislation.gov.uk/ukpga/2000/37>
- Ref 7-7** HM Government (1990). The Planning (Listed Building and Conservation Areas) Act 1990. Available at: <https://www.legislation.gov.uk/ukpga/1990/9>
- Ref 7-8** HM Government (2023). Levelling-up and Regeneration Act 2023. Available at: <https://www.legislation.gov.uk/ukpga/2023/55>
- Ref 7-9** HM Government (1981). Wildlife and Countryside Act 1981. Available at: <https://www.legislation.gov.uk/ukpga/1981/69>
- Ref 7-10** HM Government (2012). Town and Country Planning (Tree Preservation) (England) Regulations 2012. Available at: <https://www.legislation.gov.uk/uksi/2012/605/contents>
- Ref 7-11** HM Government (1997). Hedgerow Regulations 1997. Available at: <https://www.legislation.gov.uk/uksi/1997/1160/contents/made>
- Ref 7-12** HM Government (2025). Department for Energy Security & Net Zero (2025). Overarching National Policy Statement for Energy (EN-1). Available at: <https://assets.publishing.service.gov.uk/media/68093d68148a9969d2394f59/draft-nps-en-1.pdf>
- Ref 7-13** HM Government (2023). Department for Energy Security & Net Zero (2023). National Policy Statement for natural gas supply infrastructure and gas and oil pipelines (EN-4). Available at: Ferrybridge Next Generation Power Station Project <https://www.gov.uk/government/publications/national-policy-statement-for-natural-gas-supply-infrastructure-and-gas-and-oil-pipelines-en-4>.
- Ref 7-14** HM Government (2024). Ministry of Housing, Communities & Local Government and Department for Levelling Up, Housing and Communities (2024). National Planning Policy Framework. Available at: https://assets.publishing.service.gov.uk/media/67aafe8f3b41f783cca46251/NPPF_December_2024.pdf

- Ref 7-15** HM Government (2023). Department for Energy Security & Net Zero (2023). Carbon Capture, Usage and Storage A Vision to Establish a Competitive Market. Available at: <https://assets.publishing.service.gov.uk/media/6594718a579941000d35a7bf/carbon-capture-usage-and-storage-vision-to-establish-a-competitive-market.pdf>
- Ref 7-16** HM Government (2011). Department for Environment, Food & Rural Affairs (2011) UK Marine Policy Statement. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/69322/pb3654-marine-policy-statement-110316.pdf
- Ref 7-17** HM Government (2021). North West Inshore and North West Offshore Marine Plan. Available at: https://assets.publishing.service.gov.uk/media/60f6f5a1d3bf7f56824cc628/FINAL_North_West_Marine_Plan_1_.pdf
- Ref 7-18** Peak District National Park Authority (2011). Local Development Framework Core Strategy 2011. Available at: <https://www.peakdistrict.gov.uk/planning/policies-and-guides/core-strategy>
- Ref 7-19** Peak District National Park Authority (2019). Peak District National Park Development Management Policies. Available at: <https://www.peakdistrict.gov.uk/planning/policies-and-guides/development-management-policies>
- Ref 7-20** Peak District National Park Authority (nd). Landscape Sensitivity study. Available at: https://www.peakdistrict.gov.uk/_data/assets/pdf_file/0025/69073/SPD-Landscape-Sensitivity-Assessment-and-Wind-Turbine-Guidance.pdf
- Ref 7-21** Peak District National Park Authority. Peak District National Park Management Plan. Available at: <https://www.peakdistrict.gov.uk/looking-after/strategies-and-policies/national-park-management-plan>
- Ref 7-22** Jodrell Bank Observatory (University of Manchester) (2018). Jodrell Bank Observatory Management Plan. Available at: <https://whc.unesco.org/document/168618>
- Ref 7-23** North East Derbyshire District Council (2021). The North East Derbyshire Local Plan 2014-2034. Available at: <https://www.ne-derbyshire.gov.uk/planning-and-local-plan/planning-policy-and-local-plan/development-plan>
- Ref 7-24** Staffordshire Moorlands District Council (2020). The Adopted Local Plan 2014 – 2033. Available at: <https://www.staffsmoorlands.gov.uk/localplan>
- Ref 7-25** Staffordshire Moorlands District Council (2015). Wind Turbine Landscape Sensitivity Study for Staffordshire Moorlands District. Available at: https://www.staffsmoorlands.gov.uk/media/1219/Wind-Turbine-Landscape-Sensitivity-Study-Jan-2015/pdf/ca6195_Staffordshire_Moorland_LSA_20150130_V4_0_LR.pdf?m=1480440282133
- Ref 7-26** Staffordshire Moorlands District Council (2016). Landscape, Local Green Space and Heritage Impact Study. Available at: <https://www.staffsmoorlands.gov.uk/media/696/Landscape-Local-Green-Space-and-Heritage-Impact->

[Study/pdf/0cLandscape Local Green Space and Heritage Impact Study.pdf?m=1479294108403](#)

- Ref 7-27** Wirral Council (2025). Wirral Local Plan 2022 – 2040. Available at: <https://www.wirral.gov.uk/planning-and-building/local-plans-and-planning-policy/wirral-development-plan/wirral-local-plan>
- Ref 7-28** Wirral Metropolitan Borough Council (2020) Wirral Local Landscape Designations Review and Recommendations. Available at: <https://www.wirral.gov.uk/planning-and-building/local-plans-and-planning-policy/local-planning-evidence-and-research-report-60>
- Ref 7-29** Cheshire East Borough Council (2017). Cheshire East Local Plan 2010 – 2030. Available at: <https://www.cheshireeast.gov.uk/pdf/planning/local-plan/local-plan-strategy-web-version-1.pdf>
- Ref 7-30** Cheshire East Borough Council (2013). Cheshire East: Local Landscape Designations. Available at: <https://www.cheshireeast.gov.uk/pdf/planning/spatial-planning/researchand-evidence/environment/en-ldf-landscape%20study.pdf>
- Ref 7-31** Cheshire East Borough Council (2013). Landscape Sensitivity to Wind Energy Developments. Available at: <https://www.cheshireeast.gov.uk/pdf/planning/spatial-planning/researchand-evidence/environment/en-ldf-windenergystudy.pdf>
- Ref 7-32** Cheshire East Borough Council (2025). A new local plan for Cheshire East. Available at: <https://www.cheshireeast.gov.uk/planning/spatial-planning/cheshire-east-local-plan/new-local-plan.aspx>
- Ref 7-33** Cheshire West and Chester Council (2015). Local Plan (Part One) Strategic Policies. Available at: <https://www.cheshirewestandchester.gov.uk/your-council/policies-and-performance/council-plans-policies-and-strategies/planning-policy/local-plan/local-plan-part-one>
- Ref 7-34** Cheshire West and Chester Council (2019). Local Plan (Part Two) Land Allocations and Detailed Policies. Available at: <https://www.cheshirewestandchester.gov.uk/your-council/policies-and-performance/council-plans-policies-and-strategies/planning-policy/local-plan/local-plan-part-two>
- Ref 7-35** Cheshire West and Chester (2017). Local Landscape Designations: Areas of Special County Value in Cheshire West and Chester. Available at: <https://www.cheshirewestandchester.gov.uk/asset-library/local-landscape-designations-areas-of-special-county-value-june-2017.pdf>
- Ref 7-36** Cheshire West and Chester (2025). Cheshire West and Chester new Local Plan Consultation. Available at: <https://www.cheshirewestandchester.gov.uk/your-council/policies-and-performance/council-plans-policies-and-strategies/planning-policy/local-plan>
- Ref 7-37** High Peak Borough Council (2016). High Peak Local Plan. Available at: <https://www.highpeak.gov.uk/article/646/The-Adopted-Local-Plan-2016>
- Ref 7-38** Derbyshire Dales District Council (2017). The Adopted Derbyshire Dales Local Plan. Available at: <https://www.derbyshiredales.gov.uk/planning/planning-policy-and-local-plan/local-plan/local-plan-information-and-adoption>

- Ref 7-39** East Staffordshire Borough Council (2015). East Staffordshire Local Plan 2012 – 2031. Available at:
<https://www.eaststaffsbc.gov.uk/sites/default/files/docs/planning/planningpolicy/localplan2012-2031/Local-Plan-2012-2031-FINAL.pdf>
- Ref 7-40** Natural England (2014). An Approach to Landscape Character Assessment . Available at:
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/691184/landscape-character-assessment.pdf
- Ref 7-41** Landscape Institute (2021). Technical Guidance Note 02/21: Assessing Landscape Value outside National Designations. Available at:
<https://landscapewpstorage01.blob.core.windows.net/www-landscapeinstitute-org/2021/05/tgn-02-21-assessing-landscape-value-outside-national-designations.pdf>
- Ref 7-42** Planning Inspectorate (2025). Nationally Significant Infrastructure Projects: Advice on Good Design. Available at: <https://www.gov.uk/guidance/nationally-significant-infrastructure-projects-advice-on-good-design#environmental-impact-assessment-eia-and-good-design>
- Ref 7-43** Landscape Institute and Institute of Environmental Management and Assessment (2013). Guidelines for Landscape and Visual Impact Assessment 3rd Edition. Abingdon: Routledge.
- Ref 7-44** Landscape Institute (2024). Notes and Clarifications on aspects of the 3rd Edition Guidelines on Landscape and Visual Impact Assessment (GLVIA3). Available at:
https://www.landscapeinstitute.org/wp-content/uploads/2024/08/LITGN-2024-01-GLVIA3-NC_Aug-2024.pdf.
- Ref 7-45** Landscape Institute (2020). Infrastructure, Technical Guidance Note 04/20. Available at:
<https://landscapewpstorage01.blob.core.windows.net/www-landscapeinstitute-org/2018/01/LI-Infrastructure-TGN-FINAL-200924.pdf>
- Ref 7-46** Landscape Institute (2017). Tranquillity – An Overview. Available at:
<https://landscapewpstorage01.blob.core.windows.net/www-landscapeinstitute-org/2017/02/Tranquillity-An-Overview-1-DH.pdf>
- Ref 7-47** Landscape Institute (2018). Townscape Character Assessment Technical Information Note 5/17. Available at: <https://landscapewpstorage01.blob.core.windows.net/www-landscapeinstitute-org/2018/04/tin-05-2017-townscape.pdf>
- Ref 7-48** Landscape Institute (2019). Technical Guidance Note (TGN) 06/2019: Visual Representation of Development Proposals. Available at:
https://landscapewpstorage01.blob.core.windows.net/www-landscapeinstitute-org/2019/09/LI_TGN-06-19_Visual_Representation.pdf
- Ref 7-49** Environment Agency (2002). Environmental impact assessment (EIA): a handbook for scoping projects - Scoping the environmental Impacts of Carbon Capture, Transport and Storage. Available at:
<https://assets.publishing.service.gov.uk/media/5a7564f940f0b6360e473c6b/geho0811bucq-e-e.pdf>
- Ref 7-50** The Town and Country Planning (Jodrell Bank Radio Telescope) Direction 1973. Available at: https://www.cheshireeast.gov.uk/planning/spatial-planning/cheshire_east_local_plan/site-allocations-and-policies/sadpd-

[examination/documents/examination-library/cec-30-town-and-country-planning-jodrell-bank-radio-telescope-direction-1973.pdf](#)

Ref 7-51 Natural England (2025). Natural England – National Character Area Profiles. Available at: [https://nationalcharacterareas.co.uk/](#)

Ref 7-52 Cheshire East Borough Council (2018). Cheshire East Local Landscape Designation Review. Available at: [https://www.cheshireeast.gov.uk/pdf/environment/landscape/ed11-cheshire-east-lld-review.pdf](#)

Ref 7-53 Chester West and Chester Council (2017). Local landscape designation: Areas of Special County Value in Cheshire West and Chester. Available at: [https://www.cheshirewestandchester.gov.uk/asset-library/local-landscape-designations-areas-of-special-county-value-june-2017.pdf](#)

Ref 7-54 Peak District National Park Authority (2022). Peak District Landscape Strategy 2022-31. Available at: [https://www.peakdistrict.gov.uk/looking-after/strategies-and-policies/landscape-strategy](#)

Ref 7-55 East Midlands Landscape Partnership (2009). East Midlands Regional Landscape Assessment. Available at: [https://publications.naturalengland.org.uk/publication/5635681403535360](#)

Ref 7-56 Derbyshire County Council (1996). The Landscape Character of Derbyshire. Available at: [https://www.derbyshire.gov.uk/environment/conservation/landscapecharacter/landscape-character.aspx](#)

Ref 7-57 Staffordshire County Council (2001). 'Planning for landscape change' supplementary planning guidance. Available at: [https://www.staffordshire.gov.uk/environment/Environment-and-countryside/NaturalEnvironmentLandscape.aspx](#)

Ref 7-58 Staffordshire Moorlands District Council (2008). Landscape and Settlement Character of Staffordshire Moorlands. Available at: [https://www.staffsmoorlands.gov.uk/media/643/Landscape-and-Settlement-Character-Assessment/pdf/Landscape and Settlement Character Assessment.pdf](#)

Ref 7-59 Staffordshire Moorlands District Council (2011). Churnet Valley Landscape Character Assessment. Available at: [https://www.staffsmoorlands.gov.uk/media/2134/Churnet-Valley-Landscape-Character-Assessment-2011./pdf/7hChurnet Valley Landscape Character Assessment 2011.pdf?m=1494407688450](#)

Ref 7-60 Wirral Council (2019). Wirral Landscape Character Assessment. Available at: [https://www.wirral.gov.uk/planning-and-building/local-plans-and-planning-policy/local-planning-evidence-and-research-report-35](#)

Ref 7-61 Chester East Borough Council (2018). Cheshire East Landscape Character Assessment. Available at: [https://www.cheshireeast.gov.uk/pdf/environment/landscape/landscape-character-areas-and-strategies.pdf](#)

Ref 7-62 Chester West and Chester Council (2016). A landscape Strategy for Cheshire West and Chester Borough. Available at:

<https://www.cheshirewestandchester.gov.uk/residents/planning-and-building-control/total-environment/local-landscape-character-assessment-landscape-strategy-2016>

- Ref 7-63** High Peak Borough Council (2006). Landscape Character Supplementary Planning Document. Available at: [https://www.highpeak.gov.uk/media/420/Landscape-Character-SPD-March-2006/pdf/Landscape SPD March06.pdf](https://www.highpeak.gov.uk/media/420/Landscape-Character-SPD-March-2006/pdf/Landscape_SPD_March06.pdf)
- Ref 7-64** Derbyshire Dales District Council (2018). Landscape Character and Design Supplementary Planning Document. Available at: <https://www.derbyshiredales.gov.uk/documents/landscape-character-and-design-supplementary-planning-document-adopted-september-2018/download>
- Ref 7-65** Institute of Lighting Professionals (2021). Guidance Note 1 for the reduction of obtrusive light 2021. Available at: <https://theilp.org.uk/publication/guidance-note-1-for-the-reduction-of-obtrusive-light-2021/>

8. Traffic and Movement

8.1 Introduction

- 8.1.1 This chapter of the Scoping Report presents an initial baseline for traffic and movement relevant to the Proposed Development, identifies the need for additional surveys to ensure there is appropriate information to accurately characterise the baseline and sets out the Study Area. In addition, the chapter provides an overview of the assessment methodology to be followed for the environmental assessment and details the potential effects provisionally identified.
- 8.1.2 Traffic and movement effects are interrelated with other environmental effects but will be assessed separately. Traffic effects associated with the Proposed Development relate to the changes to generation of traffic during construction, operation and decommissioning of the Proposed Development and the impacts on the local and strategic transport network.
- 8.1.3 This chapter is supported by the following figures (included within Appendix B):
- Figure 8.1: Proposed Traffic and Movement Study Area – Tarmac and Buxton Lime (Tunstead) Capture Facilities Scoping Boundary;
 - Figure 8.2: Proposed Traffic and Movement Study Area – Holcim (Cauldon) Capture Facility Scoping Boundary; and
 - Figure 8.3: Proposed Traffic and Movement Study Area – Breedon (Hope) Capture Facility Scoping Boundary.

8.2 Legislation, Policy and Guidance

- 8.2.1 A brief overview of the policy, legislation and guidance relevant to the traffic and movement assessment have been reviewed and summarised in the tables below.

Table 8-1: Traffic and Movement - Legislation

Legislation	Relevance to Assessment
The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017	5(2) The EIA must identify, describe and assess in an appropriate manner, in light of each individual case, the direct and indirect significant effects of the Proposed Development on the following factors: (a) population and human health; (b) biodiversity, with particular attention to species and habitats protected under [any law that implemented] Directive 92/43/EEC and Directive 2009/147/EC; (c) land, soil, water, air and climate; (d) material assets, cultural heritage and the landscape; (e) the interaction between the factors referred to in sub-paragraphs (a) to (d). Changes to traffic and movement flows as a result of the Proposed Development may result in effects on air and climate, population and human health, biodiversity, air and climate and materials assets and cultural heritage aspects. Therefore, the potential changes to traffic and

Legislation	Relevance to Assessment
	movements as result of the Proposed Development are considered relevant to the assessment.

Table 8-2: Traffic and Movement - Policy

Policy	Relevance to Assessment
Overarching National Policy Statement for Energy (EN-1), 2025 (Ref 8-1)	Section 5.14 (traffic and transport) is relevant to this chapter of the Scoping Report and provides detail of what should be included in this part of this assessment.
National Planning Policy Framework (NPPF), 2024 (Ref 8-2)	Section 9 is relevant to this chapter of the Scoping Report as details on promoting sustainable transport are outlined. Paragraph 118 of the National Planning Policy Framework sets out that all developments that generate significant amounts of transport movement should be supported by a Transport Statement or Transport Assessment.
Peak District National Park Authority Development Management Policies, 2019 (Ref 8-3)	Chapter 9 of the Development Management Policies sets out the NPA's approach to the control and management of development in relation to transport. The DMP recognises that transport plays a vital role in enabling visitors and residents to travel to, from and around the National Park. There are policies which restrict the provision of new roads and/or alterations to existing roads in the National Park unless it can be demonstrated to be in the overall public interest. Any new transport related infrastructure is to be of the highest standards of design and not detract from the character and appearance of the locality. The definitive line of the public right of way should be retained or if this is not possible an alternative route will need to be provided. Any increase of vehicular traffic on public rights of way to the detriment of their enjoyment by walkers and riders will not be permitted unless there are overriding benefits. No new or enlarged car parks are permitted unless a clear need can be shown.
High Peak Borough Council's Local Plan, 2016 (Ref 8-4)	The Local Plan sets out the principles for sustainable development including the need to ensure that existing infrastructure has the capacity to support development where required. Any new transport infrastructure that can help address traffic congestion issues and support growth is supported. All new development should be located where the highway network can satisfactorily accommodate any generated traffic or can be improved as part of the development. Development should not lead to an increase in on street parking to the detriment of the free and safe flow of traffic. The use of rail for the transportation of freight, where feasible, is supported.
Staffordshire Moorlands Council	Policy T1 sets out policies relating to development and sustainable transport. The Council will promote and support development that

Policy	Relevance to Assessment
Local Plan, 2020 (Ref 8-5)	reduces the reliance on the private car and can accommodate residual development traffic. To achieve this, development should be located where the highway network can accommodate traffic generated from the development. Development which generates significant demand for travel or is likely to have significant transport implications (as identified within a transport assessment) will, where appropriate, need to contribute towards junction improvements, traffic management, highway infrastructure and public transport provision. Any legally recognised rights of way that are affected by development are to be protected and, where possible, enhanced. The Council will also seek to minimise the environmental impact of freight road transport and work with partners to agree designated lorry routes, freight handling facilities and the greater use of rail.
Staffordshire County Council (Highway Authority)	The County Council as a Local Highway Authority has an obligation to assess the transportation impact of all development proposals to make sure that they can be satisfactorily included into the transport network. A Transport Assessment may be required to demonstrate how the development can be assimilated into the highway network.
Derbyshire Dales District Council Local Plan, 2017	Policy S1 sets out sustainable development principles including reducing the need to travel and reducing reliance on the private car. Policy HC19 requires new development to be located where the highway network can accommodate the traffic generated by the development. Development should not lead to an increase in on-street parking to the detriment of the highway network and transport assessment will be needed to support relevant proposals.
Derbyshire County Council (Highway Authority)	The County Council are involved in the approval process of any planning applications received by both the district and county planning authorities. They aim to ensure that all new developments within Derbyshire are assessed in terms of their safety and impact on the roads.
Cheshire East Council Local Plan, 2017 (Ref 8-8)	Policy CO1 sets out how development will contribute to sustainable travel and transport. Development will be expected to reduce the need to travel by being located in sustainable locations and reduce the level of trips by single occupancy vehicles. Road, rail and freight transport routes and associated intermodal freight transport facilities should be improved to assist the sustainable and efficient movement of goods.
Cheshire West and Chester Council Local Plan, 2015 (Ref 8-9)	Policy Strat 10 of Part One of the Local Plan requires new development to demonstrate that additional traffic can be accommodated safely and satisfactorily within the existing or proposed highway network. Opportunities will be sought to extend and improve access to local footpath and cycle networks, including greenways, canal towpaths and the Public Rights of Way networks.

Policy	Relevance to Assessment
	Policy T1 of Part Two of the Local Plan requires any local road network improvement schemes to deliver significant benefits to traffic management.
Wirral Council Local Plan, 2025 (Ref 8-10)	Policy WS 9 sets out the Council's strategy for transport. Any development proposals should where practicable incorporate measures to promote the availability of sustainable transport options. They must also demonstrate that the resulting cumulative impacts on the efficient operation of the highway and transport network will not be severe. Development proposals will not create hazardous highway conditions and any proposals for major development will be required to provide a Transport Assessment. It will also be required, where relevant, for development proposals to demonstrate how they will not result in a material increase or significant change in the character of traffic using a rail crossing, unless it can be demonstrated safety will not be compromised.

Table 8-3: Traffic and Movement – Standards and Guidance

Legislation	Relevance to Assessment
ISEP Guidelines for the Environmental Assessment of Road Traffic (2023) (Ref 8-11)	The ISEP guidelines provide thresholds and standards for measuring the traffic and transport impacts of a development.
The Design Manual for Roads and Bridges, National Highways (NH) (Ref 8-12)	Provides requirements and advice documents relating to works on motorway and all-purpose trunk roads in the UK.
DLUHC Guidance: Travel Plans, Transport Assessments and Statements (2014) (Ref 8-13)	Sets out ways of assessing and mitigating the negative transport impacts of developments that generate significant amounts of movement, in order to promote sustainable development.
Department for Transport (DfT) Strategic Road Network and the Delivery of Sustainable Development, Circular 01/2022 (Ref 8-14)	Guidance explaining how NH will engage with the planning system and fulfil its remit to be a partner for sustainable economic growth, whilst maintaining, managing and operating a safe and efficient strategic road network, with an emphasis on encouraging measures to reduce the impact of traffic.

8.3 Defining the Study Area

- 8.3.1 The Study Area will include the highway links, bus routes, pedestrian / cycle network, railways and navigable waterways which could potentially be impacted by trips from and to the Proposed Development.
- 8.3.2 Further detailed design engineering work is currently underway to identify the exact construction vehicle routes which would be used for the Proposed Development. It is assumed that construction HGVs will travel to the site via the Strategic Road Network (SRN) and primary road network and then use the most appropriate local routes.

- 8.3.3 Further detail on the specific roads to be used will be presented within both the PEIR and ES. The assignment and distribution of construction workers have not been estimated at this stage. For the purpose of scoping, an initial Study Area has been defined based on professional judgement as to the routes that may be used by staff and HGVs accessing the site.
- 8.3.4 The highway links, bus routes, pedestrian / cycle network, railways and navigable waterways, which may be potentially impacted by the Proposed Development (during each phase of the project), are described in Section 8.4.
- 8.3.5 The Study Area will be further refined at the assessment stage to ensure a proportional approach.
- 8.3.6 The Proposed Development is split into a number of key components, and the assumed construction routes, are presented for each below:

Breedon Capture Facility

- 8.3.7 Access to the proposed Breedon Capture Facility is assumed to be via the existing Breedon Hope Cement Works access off Pindale Road. It is assumed that construction HGVs will travel via the A6187 Road and Pindale Road to the site access. Further engineering work is being undertaken to explore if any new road infrastructure is required, and if so, this would be assessed within the ES.

Tarmac Capture Facility and Buxton Lime Capture Facility

- 8.3.8 Access to the proposed Tarmac Capture Facility and the proposed Buxton Lime Capture Facility is assumed to be via existing Tarmac Tunstead Cement access off Waterswallows Road. It is assumed that HGVs will travel via the A6 and then Waterswallows Road to the site access.

Holcim Capture Facility

- 8.3.9 Access to the proposed Holcim Capture Facility is assumed to be via Earlsway at the point it intersects with Yelsway Lane. It is assumed that construction HGVs will travel via the A523 and then Earlsway Road to the site access.

Peak Cluster Pipeline and Coastal AGI to MLWS Pipeline(s)

- 8.3.10 At this stage, the location of the construction compounds / laydown areas, HGV routes and pipeline construction access points are yet to be established. The access routes to the operational AGIs are also not yet confirmed. Further detailed engineering work is ongoing to determine these. For the purposes of Scoping, the strategic roads (motorways, A roads and B roads) which intersect with the red line boundary and could therefore be used for construction HGV access have been identified in Section 8.4. These will be reviewed at PEIR stage once more detailed construction information is available and a pipeline Study Area will be more clearly defined.

8.4 Baseline Environment

- 8.4.1 An initial study of the baseline environment has been undertaken through desk-based research.
- 8.4.2 The exact construction vehicle routes for the project are not known at this stage and therefore baseline data collection has been limited to assumptions made using a desk-based study drawn on publicly available mapping and aerial imagery from Google Maps together with constraints information held within the project WebGIS platform. Traffic and transport impacts have the potential to go beyond the Scoping Boundary, and these would be assessed within the PEIR and ES.
- 8.4.3 Key Sources of information for the traffic and transport baseline include:

- Road network - Google Maps;
- Bus route information – local bus operators, traveline.info;
- Rail information – National Rail;
- Waterways – EA and Navigation Authority; and
- Designated non-motorised user (NMTU) routes and public rights of Way (PROW) – Sustrans, Local Authority Definitive maps.

8.4.4 The initial baseline for each site is presented in Table 8-4 to Table 8-6. The initial baseline for the pipeline is presented in Table 8-7 to Table 8-10.

Baseline – Operator sites

Table 8-4: Traffic and Movement – Breedon Capture Facility

Traffic and Movement Baseline – Breedon Capture Facilities
Baseline
The Proposed Development is located to the north of Bradwell village and south of Hope village and is accessed via Pindale Road. Highway network The key highway links providing access the proposed site are: A6187 Road - The A6187 is a predominately two-way, single carriageway road which connects Castleton to the east of the Proposed Development to Hathersage, located to the west. The road does however narrow and become one way at a pinch point within Hathersage. The speed limit varies from national speed limit to 30 mph in the more built-up areas. There is a school safety zone within Hathersage where the speed limit drops to 20 mph at specific times of the day. East of Hathersage, as the railway bridge passes over the A6187, there is a height restriction of 4.4 m. There are footpaths, bus stops and street lighting on both sides of the road as it passes through settlements. Beyond the settlements there is generally footpath provision on at least one side. There are intermittent sections outside of the settlements where there is no footpath provision. There is an advisory cycle lane on both sides of the carriageway to the west of Hathersage. Parallel to the advisory cycle lane, on the northern side of the road, is a shared pedestrian and cycle path which runs between Hathersage and the A6187 / A6013 junction, and forms part of the Cross Pennine Greenway. A57 – The A57 is a major road which runs east to west connecting Sheffield to the east to Manchester to the west. As the A57 passes approximately 5km north of the Proposed Development adjacent to Ladybower Reservoir, it is a two-way, single carriageway road with a 50mph speed limit, dropping to 30mph in the built-up urban areas. Footpath provision is intermittent, with provision on the southern side of the A57 to the east of the bridge over Ladybower Reservoir and no footpaths provided west of the bridge. There is a stretch of shared use walking / cycling path on the southern side of the A57 between its junction with the A6013 and where the bridge over Ladybower Reservoir ends. There are several lay-bys along the A57, predominately east of the bridge over Ladybower Reservoir which allow for unrestricted parking. A6013 - The A6013 connects the A57 to the A6187 and travels through the village of Bamford. It is a two-way, single carriageway road. The speed limit varies from 40 mph south of Bamford, 30 mph as it passes through, and 50 mph north of the village. There is a school safety zone within Bamford where the speed limit drops to 20 mph at specific times of the day. Typically, there is a

Traffic and Movement Baseline – Breedon Capture Facilities

footpath on at least one side of the road; however, north of Bamford the provision becomes more sporadic with intermittent gaps. There is a short stretch, approximately 100 m of length, of shared use walking/cycling path north of the A6013 / A6187 junction. There is further provision north of Ladybower Dam to its junction with the A57; however, beyond these there is no other formal cycling provision. North of Bamford there are intermittent laybys which allow for unrestricted parking.

Pindale Road – Pindale Road is a minor road which connects the A6187, located to the north-east of the Proposed Development to Castleton, located to the west. It is predominately national speed limit with a short stretch at 30 mph as it leaves the village of Hope. It is two-way, single carriageway up until the existing site access to the Cement Works; however, beyond the expected access to the Proposed Development, the route is marked as unsuitable for HGVs and is very narrow with insufficient width to allow two vehicles to pass at the same time. No formal passing places are provided. Beyond the village of Hope, there are no pedestrian or cycling facilities along the route.

Walking and Cycling

To the east of the site there is a small network of PRow which run north to south connecting Pindale Road to the north with the village of Smalldale to the south. Located north of the site, Hope Footpath 7, runs east to west and connects Pindale Road with the village of Castleton. To the south and south-east of the existing quarry is a further network of footpaths which connect both Smalldale and Bradwell with an extensive network of rights of way within a predominantly rural area located to the north-west of the site.

There are several PRow which intersect with the A6187 providing access to the extensive PRow network established in the rural areas to north of the site. As the A6013 passes through Bamford there are numerous footpaths which intersect with the road connecting Bamford to an extensive network of rights of way located both to the east and west of the village.

Pindale Road forms part of National Cycle Network (NCN) Route 6 along the entirety of its length. NCN Route 6 ends at the village of Castleton and provides a connection through the Peak District to Sheffield, to the north-east of the site. As outlined above there are several cycling facilities provided along both the A6187 and the A6013.

Public Transport

There are no bus stops within the vicinity of the Proposed Development. The nearest bus stops are located in Hope, on the A6187, located approximately 1.5 km to the north-east of the site. They are served by several bus services providing access to destinations such as Sheffield, Castleton, Bakewell and Buxton.

The Proposed Development is served by a rail line however this is a freight only line serving the existing Cement Works. The nearest passenger services are available from Hope station located approximately 2 km to the north-east of the site. From here, Northern Rail operates one service an hour between Sheffield and Manchester Piccadilly. The station is also serviced by one East Midlands Rail service a day between Liverpool Lime Street and Nottingham.

Waterways

There are no navigable waterways within the vicinity of the Proposed Development.

Sensitive Receptors

Traffic and Movement Baseline – Breedon Capture Facilities

A6187 Road - As the A6187 Road passes through Hathersage there are several residential and commercial properties including hotels, pubs and educational facilities. Between Hathersage and Hope the receptors include clusters of residential buildings, hotels, and a caravan park. Within Hope itself there is a college and a church, and within Castleton there are residential buildings and hotels alongside several pubs and cafes.

A57 – There are significant number of receptors along the A57 as it passes through built-up urban areas including residential buildings, medical buildings, education facilities, care homes, and churches. In the more rural areas they are far more dispersed and limited to the occasional isolated dwelling, pub and hotel. Within Glossop there are several receptors including residential buildings, pubs, commercial properties including a busy, well established high street.

A6013 - Along the A6013 there are residential properties, a caravan and camping park, commercial properties and places of worship.

Pindale Road – There are only a limited number of receptors along Pindale Road including the occasional residential property and an outdoor recreational facility.

Table 8-5: Traffic and Movement Baseline – Tarmac Capture Facility and Buxton Lime Capture Facility

Traffic and Movement Baseline – Tarmac and Buxton Lime Capture Facilities

Baseline

The Tarmac Tunstead Cement site and the Buxton Lime sites are located near Buxton in Derbyshire. The cement works and lime works are located on the same overall site but operated by separate companies. Both are accessed off Waterswallows Road.

Highway network

The key highway links providing access to the Proposed Development are:

A6 – the A6 is one of the main north-south primary roads in England. In the vicinity of the site, it is a two-way, single carriageway road which travels south through the village of Dove Holes and into the town of Buxton, then travels east through the town of Bakewell. In the vicinity of the Proposed Development, it is subject to a 50 mph speed limit for the most part, dropping to 30mph as it passes through the towns and villages. As it passes through the towns and villages, there are footpaths, bus stops, street lighting and frontage developments on both sides of the road. The rural sections have sporadic provision of footways and occasional frontage developments. There are no cycle lanes in the vicinity of the Proposed Development.

Waterswallows Road – Waterswallows Road is a two-way, single carriageway road which connects the A6 to the site access. It has a 7.5 tonne weight limit, except for access. Within Buxton, it is subject to a 30 mph speed limit and has a footway on one side of the road, streetlighting and frontage development and greenspace on the other side. Once it leaves Buxton, it is subject to a 60 mph speed limit and it travels through greenspace. There are no footpaths or street lighting on the rural sections.

Un-named Road (east of Upper End Road / Waterswallows Road junction) – an un-named road connects to Waterswallows Road at its junction with Upper End Road. It currently serves the existing access to the Tarmac car park and Tunstead House and is two-way single carriageway with a 60 mph speed limit. There is a zebra crossing connecting the car park to Tunstead House however there are no further pedestrian facilities along the road.

Traffic and Movement Baseline – Tarmac and Buxton Lime Capture Facilities

Walking and Cycling

Considering the rural nature of the site, there is an extensive PRoW network within the local area. Wormhill Footpath 19 is immediately to the north of the existing cement works and intersects the Proposed Development and connects Longridge Lane to an extensive network of PRoW east of the existing cement works.

Waterswallows Road can also be used to access this network to the east. To the south of the site and north of the A6 there is a further network of PRoW, mainly running east to west. These provide access to Buxton to the west and several villages and hamlets located to the east of the site. Along the A6 there are several PRoW which intersect with the road - within the vicinity of the site these are predominately located to the north of Buxton and to the north of Dove Holes. There are no National Cycle Routes in the vicinity of the Proposed Development.

Public Transport

Bus service 190, operated by High Peak, is accessible from bus stops located approximately 1km north of the site in Upper End and on Waterswallows Road, approximately 1.5 km to the east of the site. There are eight services throughout the day between 07:00 and 19:00 providing access to Upper End, Peak Dale, Chapel-en-le-Frith, Chinley and Whaley Bridge to the north of the site and Buxton to the west of the site.

Bus service 190 stops at both Buxton and Dove Holes stations (the former is located 4 km to the east of the Proposed Development and the latter 4 km to the north), both are served by an hourly Northern rail service between Manchester Piccadilly and Buxton.

Rail

The Proposed Development is served by a rail line however this is a freight only line serving the existing Cement Works.

Waterways

There are no navigable waterways within the vicinity of the Proposed Development.

Sensitive Receptors

A6 - numerous shops, public houses, housing, parks as it passes through the urban areas.

Waterswallows Road – housing, church hall, public house as it passes through Buxton.

Un-named Road – there is an office located south-east of the Upper End Road / Waterswallows Road junction.

Table 8-6: Traffic and Movement Baseline – Holcim Capture Facility

Traffic and Movement Baseline – Holcim Capture Facilities

Baseline

The Holcim site is located in Staffordshire, situated to the south of Waterhouses village and north of the Cauldon Quarry. The Proposed Development is accessed via Earlsway.

Highway network

The key highway links providing access to the Proposed Development are:

A523 – The A523 is located to the north of the Proposed Development and connects the A52 to the north-east of the Proposed Development with the town of Leek. Beyond Leek, the A523

Traffic and Movement Baseline – Holcim Capture Facilities

provides an onward connection to Macclesfield and the Manchester Airport Eastern Link Road. Within the vicinity of the Proposed Development, its a two-way, single carriageway road, and which is subject to a 50 mph speed limit, dropping to 30 mph as it passes through Waterhouses. Footpath provision is intermittent with a footpath provided on both sides of the road as it passes through Waterhouses, however beyond the village there are no pedestrian facilities in either direction. There are no cycle facilities provided within the vicinity of the Proposed Development. There are two nearby laybys provided designated for parking, one is located to the east of Waterhouses, with another to the west of the village.

A52 – The A52 is located to the south of the Proposed Development and connects both Ashbourne and Derby, located to the east of the Proposed Development, with Stoke-on-Trent, located to the west. It connects to the A523 via a priority junction located to the east of the Proposed Development. Within the vicinity of the Proposed Development, the road is two-way, single carriageway and is subject to the national speed limit. Pedestrian provision is limited with only a short section of narrow footpath as the A52 passes through Cauldon Lowe village. There are no cycle facilities along the A52 within the vicinity of the Proposed Development.

Earlsway / Hemmingslow Lane - Earlsway which turns into Hemmingslow Lane west of the Proposed Development, is a minor road which runs north to south, connecting both the A523 and A52, and travels through the village of Cauldon. They are a two-way single carriageway road subject to the national speed limit. There is a low bridge over Hemmingslow Lane with a 4.3 m height limit, located to the east of Cauldon. A footpath is provided, on at least one side of the roads, along the entirety of their length; however no cycle facilities are provided.

Walking and Cycling

There are several PRow within the vicinity of the Proposed Development, connecting Earlsway with an extensive network of footpaths located to the east of the Proposed Development. This network intersects with the A523 at several locations and provides access to a further network of footpaths north of the A523 which provides access to several villages. To the north of the Proposed Development, there is a small network of footpaths around Shale Lake which run north to south connecting Church Lane and Hemmingslow Lane with the village of Waterhouses to the north and an extensive network of rights of way located to the west of the Proposed Development. South of the existing quarry, several footpaths intersect with the A52, predominately running north to south and provides connections to both villages and an extensive PRow network located to the south of the Proposed Development.

There are no National Cycle Routes within the vicinity of the Proposed Development.

Public Transport

The nearest bus stops are located in Waterhouses and they are served by one bus route providing four services a day between Buxton and Ashbourne. Further bus stops are located in Cauldon Lowe which provides access to a once daily service between Leek and Cheadle. There is no rail provision within the vicinity of the Proposed Development.

Waterways

There are no navigable waterways within the vicinity of the Proposed Development.

Sensitive Receptors

Traffic and Movement Baseline – Holcim Capture Facilities

A523 – Along the A523 there are several sensitive receptors including residential buildings, public houses/cafes and a hotel.

A52 – Along the A52 the sensitive receptors include isolated residential buildings, a village hall and a holiday home park.

Earlsway / Hemmingslow Lane - Along both Earlsway and Hemmingslow Lane there are several sensitive receptors including residential buildings, commercial properties and a public house.

Baseline – Pipeline

- 8.4.5 At this stage, the construction compound / laydown locations, construction routes and pipeline construction access points are not known, therefore for the purposes of Scoping, the strategic roads which intercept the red line boundary have been identified as these could be used for construction HGV access. The pipeline Study Area will be further refined at PEIR stage once more construction information is available.

Table 8-7: Traffic and Movement Baseline – Peak Cluster Pipeline (East)

Traffic and Movement Baseline – Peak Cluster Pipeline (East)

Baseline

The key highway links (motorways, A and B roads) within the Scoping Boundary or providing access to this section of pipeline are:

- B5053
- A53
- A523
- A54
- A536
- B5392
- A537
- B5087
- A538
- A523
- A6
- A5004
- B5470
- A6
- A623

Sensitive Receptors

At this stage the receptors cannot be identified. The receptors will be identified once the construction information is known and the Study Area is defined.

Table 8-8: Traffic and Movement Baseline – Peak Cluster Pipeline (Central)

Traffic and Movement Baseline – Peak Cluster Pipeline (Central)	
Baseline	
The key highway links (motorways, A and B roads) within the Scoping Boundary or providing access to this section of pipeline are: — A34 — A535 — A50 — A54 — M6 — A533 — A530 — B5081 — B5309 — A533 — B5074 — A51 — A49 — A56 — M53	
Sensitive Receptors	
At this stage the receptors cannot be identified. The receptors will be identified once the construction information is known and the Study Area is defined.	

Table 8-9: Traffic and Movement Baseline – Peak Cluster Pipeline (West)

Traffic and Movement Baseline – Peak Cluster Pipeline (West)	
Baseline	
The key highway links (motorways, A and B roads) within the Scoping Boundary or providing access to this section of pipeline are: — A5032 — A41 — M56 — A5117 — A494 — A550 — B5151 — B5133 — B5136 — A5137 — A551 — B5139	

Traffic and Movement Baseline – Peak Cluster Pipeline (West)
— B5192
Sensitive Receptors
At this stage the receptors cannot be identified. The receptors will be identified once the construction information is known and the Study Area is defined.

Table 8-10: Traffic and Movement Baseline – Coastal AGI to MLWS Pipeline(s)

Traffic and Movement Baseline – Coastal AGI to MLWS Pipeline(s)
Baseline
The key highway links (motorways, A and B roads) within the Scoping Boundary or providing access to this section of pipeline and AGI are: — A553 — A551 — B5192 —
Sensitive Receptors
At this stage the receptors cannot be identified. The receptors will be identified once the construction information is known and the Study Area is defined.

Baseline Traffic Data

- 8.4.6 Historic traffic data or Automatic Traffic Counts (ATCs) will be used to derive 24 hour Annual Average Daily Traffic (AADT) for individual links, for total traffic and HGVs. Traffic surveys may be undertaken, where deemed required. This is discussed further in Section 8.6.

Future Baseline

- 8.4.7 The future baseline reflects anticipated changes to current conditions that are expected to occur without the Proposed Development, accounting for underlying growth trends
- 8.4.8 Operational traffic movements are expected to be minimal, with occasional visits taking place by a handful of operatives. It is expected that any operational impacts on traffic and movement will be minimal. Therefore, a future baseline will be developed to test the construction phase only.
- 8.4.9 The future baseline will comprise the same Study Area and receptors as the existing (once confirmed). The future baseline will be produced by factoring the baseline traffic flows using growth factors derived from TEMPro.
- 8.4.10 The future baseline traffic volumes will be established for a single year for each location during the construction period. The peak construction period(s) will be identified within the PEIR and ES when more detailed construction information is available.

8.5 Identification of Potential Effects

Construction

- 8.5.1 Temporary effects on road users, public transport users, pedestrians and cyclists, general public, railways users and waterway users as a result of the construction of the Proposed Development.

Operation

- 8.5.2 Both the Coastal AGI and the Capture Facilities will be permanently staffed and therefore may result in changes in traffic flows. However, the long term effects as a result of the operation of the Proposed Development would not be expected to be any greater than the temporary effects experienced during the construction of the Proposed Development.

Decommissioning

- 8.5.3 Temporary effects on road users, public transport users, pedestrians and cyclists, general public, railways users and waterway users as a result of the decommissioning of the Proposed Development. Decommissioning is set to be assessed at the time it happens, in line with relevant guidance in place in the future so would be scoped out of the assessment presented within the ES.

8.6 Scope and Methodology

- 8.6.1 This Section outlines the scope and methodology that will be employed for assessing the likely significant effects associated with traffic and movement.
- 8.6.2 The assessment will be informed by desk studies and primary baseline data collected through site surveys.
- 8.6.3 The baseline desk studies will build upon the scoping baseline using publicly available data and literature, together with survey data and data requested from local authorities.
- 8.6.4 Traffic data will be obtained to determine the traffic flow baseline through various sources, including existing Department for Transport (DfT) count sites, NH, and local authority data (where available). Traffic surveys will be conducted where data is not available and at required locations to support the baseline information. The locations and types of surveys will be agreed with the Local Highways Authorities (LHAs). PRoW survey counts will also be conducted if any PRoW are impacted by the construction or operation of the Proposed Development.
- 8.6.5 Personal Injury Accident (PIA) data will be obtained and analysed to understand existing safety concerns within the vicinity of the site.

Assessment Scenarios

- 8.6.6 Where the Project is likely to have a moderate or severe impact on the local highway network, the following scenarios would be assessed to determine the impact of the Project:
- Future year (without Development); and
 - Future year plus construction (with Development)
- 8.6.7 The creation of the future year scenarios has been discussed in Section 8.4.7.
- 8.6.8 The peak construction traffic flows will be derived by analysing construction traffic data and the construction programme. Construction HGVs would be assigned to designated routes. A gravity model would be used to assign worker trips to and from the proposed construction compounds. The result of the assignment of construction traffic to the highway network will be used to calculate the percentage increase on each link relative to the Future year (without Development) traffic flows.

Scope

- 8.6.9 The Traffic and Movement assessment will be carried out in accordance with the Institute of Sustainability and Environmental Professionals (ISEP) (2023) Environmental Assessment of Traffic and Movement (“the ISEP Guidelines”).
- 8.6.10 The ISEP Guidelines recommend that several environmental effects may be considered important when considering traffic from a proposed development. The assessment will provide consideration of the following effects:
- Severance of communities;
 - Driver delay;
 - Pedestrian delay;
 - Non-motorised user amenity;
 - Fear and intimidation;
 - Road safety;
 - Road safety audits; and
 - Hazardous loads/large loads.
- 8.6.11 The ISEP Guidelines state that a link on the highway network should be included within the study if one of the following criteria is met:
- Rule 1 – Include highway links where traffic flows will increase by more than 30% (or the number of HGVs will increase by more than 30%); or
 - Rule 2 – Include highway links of high sensitivity where traffic flows have increased by 10% or more.
- 8.6.12 Highway links would therefore be assessed where traffic flows are expected to increase by 30% or more, and where there are increases of 10% or more in an area identified as sensitive.
- 8.6.13 The ISEP Guidance suggests that the rules may not be appropriate for road safety and driver delay. Safety can be assessed by a competent independent auditor/professional in accordance with DMRB guidance and driver delay by undertaking highway/junction modelling if these aspects require further consideration.

Methodology

- 8.6.14 Chapter 4 EIA Approach and Methodology sets out the standard EIA methodology and matrices to be used for the assessment. This section provides a summary of the EIA methodology specifically relevant to Traffic and Movement.
- 8.6.15 The methodology for assessing the impact of the construction traffic generated by the Proposed Development will be based on that outlined in the ISEP Guidance.
- 8.6.16 The type of traffic which is anticipated to be generated by the Proposed Development will comprise general traffic, light goods vehicles (LGVs), HGVs and Abnormal Indivisible Loads (AILs).
- 8.6.17 Once the routeing and estimated volumes of construction traffic have been established, the ‘future year (without development)’ will be compared to the ‘future year plus construction (with development)’ to establish whether the increase in traffic would meet either of ISEP Rules 1 and 2.

For those locations where there is an increase in traffic of at least 10%, the sensitive receptors will be identified.

- 8.6.18 Two of the Capture Facilities are served by existing freight rail lines. The feasibility of using rail for the transport of materials during the construction period will be explored.

Sensitivity of Receptors

- 8.6.19 The sensitivity of a road, or the immediate area through which it passes, can be defined by the type of user groups who may use it.
- 8.6.20 The ISEP Guidance identifies the following list of 'special interests' that should be considered when defining sensitive receptor locations:
- People at home/people at work;
 - Sensitive and/or vulnerable groups (including younger and older age groups; lower income; poor health status; social disadvantage; and access and geographic factors);
 - Locations with concentrations of vulnerable users (e.g. hospitals, places of worship, schools, care/retirement homes);
 - Retail areas;
 - Recreational areas/tourist attractions;
 - Collision clusters and routes with road safety concerns; and
 - Junctions and highway links already at (or over) capacity.
- 8.6.21 The ISEP Guidance states that this list of affected parties is not exhaustive. One affected party that is not on the list but will nevertheless be considered in this assessment is 'other road users'. All of the affected parties have one thing in common which is that their potential exposure to changes in traffic volume comes about through their proximity to a construction traffic route. It is important to note that the ISEP methodology does not consider the duration of effect, especially whether it is temporary (construction) or permanent (operational traffic). As such, effects identified through using this methodology may initially highlight aspects to be considered significant but later considered acceptable if the effect is temporary or infrequent (occurring for a very short duration or occasionally during construction for example).
- 8.6.22 The general criteria for defining the importance or sensitivity of receptors for traffic and movement are set out in Table 8-11. Sensitive user locations include schools, care / retirement homes, disabled parking bays, hospitals, places of worship, recreational / tourist and retail areas, routes with poor safety and congestion.

Table 8-11: Sensitivity of Receptors

Legislation	Relevance to Assessment
Very High	Highway links and junctions: more than two sensitive users locations present Walk / cycle / bridleways / PRow: heavily trafficked highways with on-road pedestrian / cycle / bridleway routes.
High	Highway links and junctions: two sensitive users location present Walk / cycle / bridleways / PRow: lightly trafficked highway with on-road pedestrian / cycle / bridleway routes

Legislation	Relevance to Assessment
Medium	Highway links and junctions with at least one of the following: — one sensitive users location present — many residential properties with direct frontage to the highway link being used for construction traffic — pedestrians using footways, PRow and / or crossings on highway link — cyclists using on-road designated cycle routes along highway link — Walk / cycle / bridleways / PRow: heavily trafficked highway with — off-road pedestrian/cycle/bridleway routes
Low	Highway links and junctions: at least one of the following: — few residential properties with direct frontage to the highway link being used for construction traffic — workplaces with direct frontage to the highway link being used for construction traffic — cyclists using off-road designated cycle routes along highway link — Walk / cycle / bridleways / PRow: lightly trafficked highway with — off-road pedestrian / cycle / bridleway route
Negligible	Highway links and junctions: no receptors on link Walk / cycle / bridleway links / PRow: pedestrian / cycle / bridleway route not running alongside carriageway

- 8.6.23 A desktop exercise will be undertaken to classify the sensitivity of the highway links within the Study Area (once confirmed). The sensitivity of links within the Study Area will be assigned based on the above criteria. The link sensitivity will be based on an average sensitivity of the whole link, some links will be broken down into sensible sections where appropriate, i.e. between junctions or villages etc.

Magnitude of Impact

- 8.6.24 The ISEP Guidance states in paragraph 1.27 that the magnitude of each impact should be determined as the predicted deviation from the baseline conditions.
- 8.6.25 The ISEP Guidance sets out the following environmental effects are susceptible to changes as a result of the Proposed Development. Many of the criteria do not provide specific thresholds by which such impacts can be measured, and as a result will be measured qualitatively where necessary.
- *Severance* – severance is the perceived division that can occur within a community when it becomes separated by major transport infrastructure. The term is used to describe a complex series of factors that separate people from places and other people. Severance may result from the difficulty of crossing a heavily trafficked road or a physical barrier created by infrastructure.
 - *Driver and passenger delay* – traffic delays to non-development traffic can occur as a result of development. The ISEP Guidance indicates that these are only likely to be significant when the

traffic on the network is already at, or close to capacity. The assessment of delay will be reported in the Transport Assessment (i.e. junction modelling) using professional judgement.

- *Non-Motorised User (NMU) delay* - Drawing upon the ISEP Guidance, the assessment of pedestrian delay serves as a proxy for the delay that other modes of non-motorised users may experience when crossing roads. In general, increases in traffic levels and/or traffic speeds are likely to lead to greater increases in non-motorised user delay. The ISEP Guidance advises against definitive thresholds and recommends the use of professional judgement to determine the significance.
- *Public transport delay* - occurs due to a temporary closure or diversion of a highway. The effect would depend on whether a temporary closure or diversion is proposed, any increases in bus journey length as a result, and how long any potential disruption would last. The assessment will consider indicative thresholds which have been derived based on professional judgement.
- *Non-Motorised User amenity* - Pedestrian amenity is broadly defined as the relative pleasantness of a journey, and is considered to be affected by traffic flow, traffic composition and pavement width/separation from traffic. Drawing upon the ISEP Guidance, with regard to amenity, there are no set thresholds, but the following is stated, “a tentative threshold for judging the significance of changes in pedestrian amenity would be where the traffic flow (or HGV component) is halved or doubled” and that “thresholds... should be used cautiously in any assessment. The assessment of amenity should pay full regard to specific local conditions.”
- *Fear and intimidation* – The ISEP Guidance indicate the extent of fear and intimidation is dependent on the total volume of traffic, heavy vehicle composition, speed of vehicles, proximity of traffic to people and the perception of protection/lack of protection. The guidance sets out thresholds to define the degree of hazard based on average traffic flow, 18hr heavy vehicle flow and average speed over an 18hr day, the level of fear and intimidation from combining the hazard scores and the magnitude of impact based on the change in level from baseline conditions.
- *Highway safety* – personal injury collision data over the most recent five-year period on the local highway, to include links and junctions along proposed construction traffic routes. These will be used to assess whether the additional traffic during construction of the Project would be likely to have a detrimental effect on road safety. The ISEP Guidance references collision rates and collision clusters. Links where traffic flows increase by more than 30 per cent (rule 1) will be considered.
- *Hazardous and dangerous loads* – The ISEP Guidance states the assessment should estimate the number and composition of such loads and if significant should include a risk or catastrophe analysis to illustrate the potential for an accident to happen. There may be a requirement to transport some abnormal or hazardous loads during construction of the Project. This will be identified as the Project progresses. The impacts of such loads will be considered as a qualitative risk assessment. The CTMP(s) and ES will include details of measures that will be employed to ensure the safe vehicular transport of components to and from the Proposed Development.

8.6.26 Table 8-12 and Table 8-13 summarise the criteria that will be used to assess the magnitude of impact, along with the thresholds that will be used to determine whether the impacts are considered large, medium, small or negligible. The duration of effects is not taken into consideration.

Table 8-12: Magnitude of Impact

Type of Impact	Magnitude of Impact			
	Negligible	Small	Medium	Large
Severance	Change in total traffic flow of <30%	Change in total traffic flow of 30% to 60%	Change in total traffic flow of 60% to 90%	Change in total traffic flow of 90% and above
Driver Delay	Magnitude of impact derived using professional judgment informed by the increase in vehicle delay and whether a junction or link is at, or close to capacity.			
Pedestrian Delay	Walking, Cycling and Horse riding (WCH) journey length increment <50m	WCH journey length increment >50-250 m	WCH journey length increment >250-500 m	WCH journey length increment >500 m
Non-motorised User Amenity	Change in traffic flow (or HGV Component) <50%	Change in traffic flow (or HGV Component) of 51% to 100%	Change in traffic flow (or HGV Component) of 101% to 150%	Change in traffic flow (or HGV Component) of >151%
Fear and Intimidation	No change in hazard level	One step change in hazard level, with: <400 vehicle increase in average 18hr AV two-way all vehicle flow; and / or <500 HV increase in total 18hr HV flow	One step change in hazard level, but with: >400 vehicle increase in average 18hr AV two-way all vehicle flow; and / or >500 HV increase in total 18hr HV flow	Two step changes in hazard level
Road Safety	Magnitude of impact derived using professional judgment informed by the frequency and severity of collisions within the Study Area and the forecast increase in traffic, noting that it is an explicit requirement of planning and highway authorities that any planning application proposals do not unacceptably increase safety risks.			

Type of Impact	Magnitude of Impact			
	Negligible	Small	Medium	Large
Hazardous/Large Loads	Based on the probability of a personal injury collision, categorised as fatal or serious, involving a hazardous/large load occurring.			

- 8.6.27 Throughout the assessment professional judgment will be applied taking account of local conditions.
- 8.6.28 An assessment of national/regional walking and cycle routes as well as PRoW will also be carried out where these are directly affected by construction works or intersected by a construction route, including in terms of severance, NMU delay, NMU amenity, and for fear and intimidation, by reviewing the thresholds as identified in Table 8-13 where relevant. In terms of PRoW diversions and/or closures, the following thresholds are proposed to identify magnitude based on professional judgement.

Table 8-13: Magnitude of Impact

Type of Impact	Magnitude of Impact			
	Negligible	Small	Medium	Large
PRoW Diversion and/or closure	A diversion and/or closure with less than 100 m increase in journey length or an increase in journey length for a less than 7 days	A diversion and/or closure with an increase in journey length of 100 - 250 m or an increase in journey length for a period of 1-4 weeks	A diversion and/or closure of 250-500 m or an increase in journey length for 4-8 weeks	A diversion and/or closure of 500 m or more or an increase in journey length for 8 weeks or more

- 8.6.29 Duration is considered when assessing the overall significance of residual effects, recognising that permanent impacts will be more significant than those of a temporary nature and reversibility of the change as set out in DMRB guidance LA 104.
- 8.6.30 The majority of traffic and movement effects will be associated with the construction of the Proposed Development and therefore would be temporary effects. Some temporary effects are likely to last longer than others, and these will be clearly reported in the PEIR and ES. The permanent closure or diversion of PRoW or changes to the road network would be permanent effects and will be reported in the PEIR and ES. Following the quantified assessment, residual effects will be reported taking into account professional judgement on the duration over which effects are likely to be experienced.

Classification of effects

- 8.6.31 The approach for evaluating the significance of effects considers the sensitivity of the receptor and the magnitude of impacts, this is outlined in Table 8-14.

- 8.6.32 Duration is considered when assessing the overall significance of residual effects, recognising that permanent impacts will be more significant than those of a temporary nature and reversibility of the change as set out in DMRB guidance LA 104.
- 8.6.33 The majority of traffic and movement effects will be associated with the construction of the Proposed Development and therefore would be temporary effects. Some temporary effects are likely to last longer than others, and these will be clearly reported in the PEIR and ES. The permanent closure or diversion of PRow or changes to the road network would be permanent effects and will be reported in the PEIR and ES. Following the quantified assessment, residual effects will be reported taking into account professional judgement on the duration over which effects are likely to be experienced.

Table 8-14: Classification of Effects

Sensitivity of Receptor	Magnitude of Change				
		Negligible	Small	Medium	Large
	High	Minor	Moderate	Major	Major
	Medium	Negligible	Minor	Moderate	Major
	Low	Negligible	Negligible	Minor	Moderate
	Very Low	Negligible	Negligible	Negligible	Minor

- 8.6.34 Only moderate and major effects are considered to be significant for the purposes of the EIA Regulations; minor and negligible effects are 'not significant'.

Transport Assessment

- 8.6.35 The ability of the highway network to accommodate the construction traffic will be assessed and reported in a Transport Assessment which will accompany the ES. The TA will include information on:
- Relevant national, regional and local policies;
 - The existing baseline conditions including a description of the roads, bus routes, railway lines, footpaths, bridleways, cycle paths and navigable waterways crossed by the route and/or impacted by the works;
 - Personal injury collision data for the most recent five-year period within the proposed Study Area;
 - Details of the Proposed Development including a project description, the construction programme, typical working width, compound locations, access routes to compounds, potential road or PRow closures/diversions and construction methods for individual railway, road and waterway crossings (where appropriate);
 - Future baseline including committed developments and transport schemes;
 - Trip generation during construction including worker trips and HGV traffic to/from compounds. Trip generation associated with the operation of the substations and Over Head Lines (OHL);
 - The distribution and assignment of construction trips on the road network;
 - The impact of the construction works and operation of the Project (where applicable) on the transport network;

- Mitigation measures, and
- Summary and conclusions.

8.6.36 The scope of the TA will be agreed with the relevant Highway Authorities. In the event that junction capacity analysis is required, this will be discussed and agreed with the LHAs and NH where necessary.

Consultation

8.6.37 The EIA will be informed by consultation and engagement with stakeholders, including the local highway authorities which cover the Study Area and NH. Other stakeholders, such as Network Rail and the Canal & Rivers Trust will be consulted, if required, once further details of the scheme and construction routes are known.

8.7 Assumptions and limitations

- 8.7.1 The traffic flow increases on the highway network during the construction phase are not yet known. Traffic flow forecasts will be estimated and available for PEIR stage.
- 8.7.2 At this stage the exact extent of the Study Area cannot be confirmed in terms of traffic and movement as the traffic flow forecasts are not yet known and detailed discussions have not yet taken place with NH or the LHAs for the strategic and local road networks respectively. The Study Area will be confirmed for PEIR stage.
- 8.7.3 At this stage, baseline traffic data has not yet been collated or reviewed and surveys have not yet been undertaken to fully understand the baseline conditions.

8.8 Summary of issues to be scoped in/out

- 8.8.1 At this stage, the traffic flow increases on the highway network during the construction phase are not yet known. Permanent operational staff and HGVs will be required at the capture facilities and the Coastal AGI. The exact numbers of staff and HGVs are currently uncertain. Due to this uncertainty, all topics, except road safety audits, have been scoped in for the construction assessment for all locations. This will be reviewed at PEIR stage once construction traffic flow forecasts are available and further assessment is undertaken.
- 8.8.2 As outlined above, decommissioning is set to be assessed at the time it happens, in line with relevant guidance in place in the future, therefore all of the sub-topics for all of the locations are scoped out of the decommissioning assessment.
- 8.8.3 A summary of the issues to be scoped in or out of the traffic and movement assessment is presented in Table 8-15 to Table 8-16.

Table 8-15: Traffic and Transport – Capture Facilities

Traffic and Transport Scope – Capture Facilities				
Scope Scoped in ✓, scoped out ✗	Construction (C), Operation (O), Decommissioning (D)			Rationale
	C	O	D	
Severance	✓	✓	✗	The construction and operation phases have potential to generate increased traffic flows within the Study Area which could impact severance. Traffic flow increases on the highway network are not yet known, therefore this is scoped in for the construction and operation assessment. Decommissioning is set to be assessed at the time it happens, therefore severance is scoped out of the decommissioning assessment
Road vehicle driver and passenger delay	✓	✓	✗	The Proposed Development could result in changes which could affect perceptions of driver delay during construction and operation because of increased vehicle traffic on the network. Driver delay is therefore scoped in for the construction and operation assessment Decommissioning is set to be assessed at the time it happens, therefore driver delay is scoped out of the decommissioning assessment.
Non-motorised user delay	✓	✓	✗	The construction and operation of the Proposed Development may result in changes which could affect perceptions of pedestrian and other non-motorised user delay because of increased vehicle traffic on the network. This is therefore scoped in for the construction and operation assessment. Decommissioning is set to be assessed at the time it happens, therefore this topic is scoped out of the decommissioning assessment.
Non-motorised user amenity	✓	✓	✗	The Proposed Development could result in changes which could affect perceptions of non-motorised user amenity during construction and operation phase because of the change in total traffic (or HGV component) on the local network. This is therefore scoped in for the construction and operation assessment. Decommissioning is set to be assessed at the time it happens, therefore this topic is scoped out of the decommissioning assessment.

Traffic and Transport Scope – Capture Facilities				
Scope Scoped in ✓, scoped out ✗	Construction (C), Operation (O), Decommissioning (D)			Rationale
	C	O	D	
Fear and intimidation	✓	✓	✗	The construction and operation traffic associated with the Proposed Development could result in an increase to Fear and Intimidation, therefore this is scoped in for further assessment at this stage. Decommissioning is set to be assessed at the time it happens, therefore this topic is scoped out of the decommissioning assessment.
Road user and pedestrian safety	✓	✓	✗	Accidents and safety are scoped in for assessment. Decommissioning is set to be assessed at the time it happens, therefore this topic is scoped out of the decommissioning assessment.
Road safety audits	✗	✗	✗	Any new or amended access points required to serve the Proposed Development to/from the public highway will be subject to Road Safety Audit at the appropriate stage, to be agreed with the LHAs and NH. This will be considered as part of the Transport Assessment and is therefore scoped out of the ES.
Hazardous / large loads	✓	✗	✗	ALLs are expected as part of construction, however the number and type are unknown at this stage. Hazardous/Large loads are therefore scoped into the assessment at this time. ALLs are not expected to be required as part of the operation of the Proposed Development, therefore this topic is scoped out of the operation assessment. Decommissioning is set to be assessed at the time it happens, therefore this topic is scoped out of the decommissioning assessment.

Table 8-16: Traffic and Transport Scope – Peak Cluster Pipeline and Coastal AGI to MLWS Pipeline(s)

Traffic and Transport Scope – Peak Cluster Pipeline and Coastal AGI to MLWS Pipeline				
Scope Scoped in ✓, scoped out ✗	Construction (C), Operation (O), Decommissioning (D)			Rationale
	C	O	D	
Severance	✓	✓	✗	The construction and operation phase has potential to generate increased traffic flows within the Study Area which could impact severance. Traffic flow increases on the highway network are not yet known, therefore this is scoped in for the construction and operation assessment. Decommissioning is set to be assessed at the time it happens, therefore severance is scoped out of the decommissioning assessment
Road vehicle driver and passenger delay	✓	✓	✗	The Proposed Development could result in changes which could affect perceptions of driver delay during construction and operation because of increased vehicle traffic on the network. Driver delay is therefore scoped in for the construction and operation assessment Decommissioning is set to be assessed at the time it happens, therefore driver delay is scoped out of the decommissioning assessment.
Non-motorised user delay	✓	✓	✗	The construction of the Proposed Development may result in changes which could affect perceptions of pedestrian and other non-motorised user delay during construction and operation because of increased vehicle traffic on the network. This is therefore scoped in for the construction and operation assessment. Decommissioning is set to be assessed at the time it happens, therefore this topic is scoped out of the decommissioning assessment.
Non-motorised user amenity	✓	✓	✗	The Proposed Development could result in changes which could affect perceptions of non-motorised user amenity during construction and operation phase because of the change in total traffic (or HGV component) on the local network. This is therefore scoped in for the construction and operation assessment.

Traffic and Transport Scope – Peak Cluster Pipeline and Coastal AGI to MLWS Pipeline				
				Decommissioning is set to be assessed at the time it happens, therefore this topic is scoped out of the decommissioning assessment.
Fear and intimidation	✓	✓	✗	The construction and operation traffic associated with the Proposed Development could result in an increase to Fear and Intimidation, therefore this is scoped in for further assessment at this stage. Decommissioning is set to be assessed at the time it happens, therefore this topic is scoped out of the decommissioning assessment.
Road user and pedestrian safety	✓	✓	✗	Accidents and safety are scoped in for assessment. Decommissioning is set to be assessed at the time it happens, therefore this topic is scoped out of the decommissioning assessment.
Road safety audits	✗	✗	✗	Any new or amended access points required to serve the Proposed Development to/from the public highway will be subject to Road Safety Audit at the appropriate stage, to be agreed with the LHAs and NH. This will be considered as part of the Transport Assessment and is therefore scoped out of the ES.
Hazardous / large loads	✓	✗	✗	AILs are expected, however the number and type are unknown at this stage. Hazardous/Large loads are therefore scoped into the assessment at this time. AILs are not expected to be required as part of the operation of the Proposed Development, therefore this topic is scoped out of the operation assessment. Decommissioning is set to be assessed at the time it happens, therefore this topic is scoped out of the decommissioning assessment.

8.9 Planned Surveys

Overview

- 8.9.1 Traffic data will be obtained to determine the traffic flow baseline through various sources, including existing DfT and local authority data (where available). Project specific traffic surveys will be conducted where data is not available and at required locations to support the baseline information.
- 8.9.2 Traffic surveys would likely consist of:
- 24 hour Automatic Traffic Counts (ATCs);
 - Peak hour Junction Turning Counts (JTCs); and
 - Queue surveys.

- 8.9.3 The surveys will be undertaken on the key highway links and junctions within the Study Area, where existing data is not available. The scope of the traffic surveys will be agreed with NH and the LHAs.
- 8.9.4 The scope of the traffic surveys is not yet decided because at this stage, the construction traffic routes are not yet known and therefore the Study Area has not yet been defined.
- 8.9.5 The traffic survey data will be used within the ES and Transport Assessment. PRow survey counts will also be conducted if any PRow are impacted by the construction or operation of the Proposed Development.

8.10 Management

- 8.10.1 Outline CTMPs and Outline Constructions Workers Travel Plans (CWTPs) will be produced and will accompany the ES.

8.11 Summary

- 8.11.1 This scoping chapter has outlined relevant legislation, policy and guidance in relation to the traffic and movement assessment for the Project. The data sources that will be used to predicate current and future baselines have been presented, before stating the management measures that will be adhered to. The potential for significant effects has been identified, as well as the associated source, impact and receptors.

8.12 References

- Ref 8-1** HM Government (2017). The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017. Available at: <https://www.legislation.gov.uk/uksi/2017/572/contents>
- Ref 8-2** Department for Energy Security & Net Zero (2025). Overarching National Policy Statement for Energy (EN-1). Available at: <https://assets.publishing.service.gov.uk/media/68093d68148a9969d2394f59/draft-nps-en-1.pdf>
- Ref 8-3** Peak District National Park Authority (2019). Development Management Policies. Available at: https://www.peakdistrict.gov.uk/_data/assets/pdf_file/0032/87269/Webpage-Final-Branded-DMP-Doc-Copy.pdf
- Ref 8-4** High Peak Borough Council (2016). Local Plan. Available at: https://www.highpeak.gov.uk/media/160/The-High-Peak-Local-Plan-Adopted-April-2016/pdf/cjThe_High_Peak_Local_Plan_Adopted_April_2016.pdf?m=1514473710280
- Ref 8-5** Staffordshire Moorlands Council (2020). Local Plan. Available at: https://www.staffsmoorlands.gov.uk/media/6155/Adopted-Local-Plan/pdf/c0Adopted_Local_Plan.pdf?m=1601645140880
- Ref 8-6** Derbyshire Dales District Council (2017). Local Plan. Available at: <https://www.derbyshiredales.gov.uk/documents/dddc-adopted-local-plan-2017-2/download>
- Ref 8-7** Cheshire East Council (2017). Local Plan. Available at: <https://www.cheshireeast.gov.uk/pdf/planning/local-plan/local-plan-strategy-web-version-1.pdf>

- Ref 8-8** Cheshire West and Chester Council (2015). Local Plan Part One Available at: <https://consult.cheshirewestandchester.gov.uk/kse/event/24907/section/3252243>. Part Two Available at: <https://consult.cheshirewestandchester.gov.uk/kse/event/34617/section/5428432>
- Ref 8-9** Wirral Council (2025). Local Plan. Available at: <https://www.wirral.gov.uk/sites/default/files/2025-07/Wirral%20Local%20Plan%202022-2040%20Written%20Statement.pdf>
- Ref 8-10** Institute of Sustainability and Environmental Professionals (2023). Guidelines for the Environmental Assessment of Road Traffic. Available at: <https://www.iema.net/media/5mrmquib/iema-report-environmental-assessment-of-traffic-and-movement-rev07-july-2023.pdf>
- Ref 8-11** National Highways (Published dates vary). The Design Manual for Roads and Bridges. Available at: <https://www.standardsforhighways.co.uk/dmrb>
- Ref 8-12** Department for Levelling Up, Housing and Communities (2014) Guidance: Travel Plans, Transport Assessments and Statements. Available at: <https://www.gov.uk/guidance/travel-plans-transport-assessments-and-statements>
- Ref 8-13** Department for Transport (2022). Strategic Road Network and the Delivery of Sustainable Development. Available at: <https://www.gov.uk/government/publications/strategic-road-network-and-the-delivery-of-sustainable-development/strategic-road-network-and-the-delivery-of-sustainable-development>

9. Noise and Vibration

9.1 Introduction

- 9.1.1 This chapter of the Scoping Report presents an initial baseline for noise and vibration relevant to the Proposed Development, identifies the need for additional surveys to ensure there is appropriate information to accurately characterise the baseline, and sets out the Study Area.
- 9.1.2 The potential effects of noise and vibration on human receptors is considered and should be read in conjunction with Chapter 14: Socio-economics and Chapter 15: Human Health. The potential disturbance of local ecological or heritage receptors from noise and vibration due to the introduction of the Proposed Development will be considered in Chapter 6: Biodiversity and Chapter 10: Historic Environment.
- 9.1.3 Potential noise and vibration impacts to be considered are:
- Construction and decommissioning noise and vibration;
 - Construction and decommissioning road traffic noise; and
 - Noise from operation of the Proposed Development.

9.2 Legislation, Policy and Guidance

- 9.2.1 A brief overview of the policy, legislative and guidance relevant to the noise and vibration assessment have been reviewed and summarised in the tables below.

Table 9-1: Legislation Relevant to Noise and Vibration

Legislation
Environmental Protection Act (EPA) 1990 Part III (Ref 9-1)
Control of Pollution Act (COPA) 1974 (Ref 9-2)
Planning Act 2008 (Ref 9-3)

Table 9-2: Planning Policy Relevant to Noise and Vibration

National Planning Policy
Overarching National Policy Statement for Energy (EN-1) (Ref 9-4)
National Policy Statement for Natural Gas Electricity Generating Infrastructure (EN-2) (Ref 9-5)
National Policy Statement for Natural Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4) (Ref 9-6)
The National Planning Policy Framework (NPPF) 2025 (Ministry of Housing, Communities and Local Government (MHCLG), 2023) (Ref 9-7)
The Noise Policy Statement for England (NPSE) 2010 (Defra, 2010) (Ref 9-8)
Planning Practice Guidance – Noise (Ministry of Housing, Communities and Local Government (MHCLG), 2019) (Ref 9-9)
Defra Noise Action Plan: Roads (Defra, 2019a) (Ref 9-10)

Regional and Local Policy
Cheshire West and Chester Council. (2019). Local Plan (Part One and Part Two) (Ref 9-11)
Cheshire East Council. (2017 & 2022). Local Plan Strategy (2017) and Site Allocations and Development Policies Document (SADPD, 2022) (Ref 9-12)
Wirral Metropolitan Borough Council. (2025). <i>Wirral Local Plan 2022–2040</i> (Adopted March 2025) (Ref 9-13)
High Peak Borough Council. (2016). <i>High Peak Local Plan 2016–2031</i> (Adopted April 2016) (Ref 9-14)
Staffordshire Moorlands District Council. (2020). <i>Staffordshire Moorlands Local Plan 2014–2033</i> (Adopted September 2020) (Ref 9-15)

Table 9-3: Standards and Guidance

Standards and Guidance
British Standard 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound (BS 4142) (Ref 9-16)
British Standard 8233 Guidance on sound insulation and noise reduction for buildings, 2014 (Ref 9-17)
British Standard 5228:2014 Part 1 (Noise) and Part 2 (Vibration): Code of practice for noise and vibration control on construction and open sites (BS 5228) (Ref 9-18)
British Standard 7445-1 Description and measurement of environmental noise – Part 1; Guide to quantities and procedures (BS 7445-1) (Ref 9-19)
British Standard 6472-1:2008 Guide to evaluation of human exposure to vibration in buildings – vibration sources other than blasting (Ref 9-20)
British Standard 7385-2:1993 Evaluation and measurement for vibration in buildings - Guide to damage levels from groundborne vibration (BS 7385-2) (Ref 9-21)
International Organisation for Standardisation ISO 9613-2:2024 Acoustics-Attenuation of sound during propagation outdoors, Part 2: Engineering method for the prediction of sound pressure levels outdoors (Ref 9-22)
Highways England (2018) Design Manual for Road and Bridges (DMRB) LA 111 Noise and vibration (Ref 9-23)
The Institute of Environmental Management and Assessment (IEMA) ‘Guidelines for Environmental Noise Impact Assessment’ (IEMA, 2014) (Ref 9-24)
The Association of Noise Consultants, Guidelines, measurement & assessment of groundborne noise & vibration (Association of Noise Consultants (ANC), 2012) (Ref 9-25)
Construction Noise - A good practice guide to the preparation, submission and management of Section 61 consents (Association of Noise Consultants (ANC), 2023) (Ref 9-26)
Professional Practice Guidance (ProPG): Planning and Noise (Association of Noise Consultants (ANC), Institute of Acoustics, Chartered Institute of Environmental Health, 2017) (Ref 9-27)
Groundborne vibration caused by mechanised construction works, TRL Report 429 (Transport Research Laboratory, 2000) (Ref 9-28)
Department for Transport (1988) Calculation of Road Traffic Noise (CRTN) (Ref 9-29)

Standards and Guidance
World Health Organization (WHO) Guidelines for Community Noise (1999) (Ref 9-46), Environmental Noise Guidelines for the European Region (2018) (Ref 9-30) and Night Noise Guidelines for Europe (2009) (Ref 9-47)
Institute of Sustainability and Environmental Professionals (ISEP) (formerly the Institute of Environmental Management and Assessment (IEMA)) - Guide to: Determining Significance For Human Health In Environmental Impact Assessment (Ref 9-31)
Institute of Sustainability and Environmental Professionals (ISEP) (formerly the Institute of Environmental Management and Assessment (IEMA)) - Guide to: Effective Scoping of Human Health in Environmental Impact Assessment (Ref 9-32)
Procedure for the assessment of low frequency noise disturbance NANR45 (Ref 9-33)

- 9.2.2 The legislation, policy, standards and guidance listed above provide methods for predicting and/or assessing environmental noise and vibration impacts resulting from construction and operation of infrastructure developments such as the Proposed Development.

9.3 Defining the Study Area

- 9.3.1 The Study Areas for the noise and vibration assessments are presented in Table 9-4. It is judged that significant noise and vibration effects will be unlikely beyond this Study Area.

Table 9-4: Noise and Vibration Study Areas

Element of the Proposed Development	Study Area
Construction and decommissioning noise	300 m from any construction activity, or the area within which sound levels from the Proposed Development are forecast to give rise to potential impacts, whichever is the greater.
Construction vibration	100 m from any construction activity, or the area within which sound levels from the Proposed Development are forecast to give rise to potential impacts, whichever is the greater.
Construction road traffic noise	50 m from the carriageway edge of public roads with the potential for an increase in basic noise level (BNL) of 1 dB(A) or more. The procedure for calculating a BNL is set out by the CRTN document and relates to a noise level at a reference location 10 m from the carriageway edge.
Operational noise from fixed mechanical and electrical equipment	The study area required for operational noise sources will largely depend upon when a source is operational (day or night-time) and the noise emission level from the source (a low noise emission level would result in a smaller study area, than for a higher noise emission level). To allow for low frequency noise assessment, a Study Area is proposed of 1 km around above ground infrastructure which is likely to emit an appreciable level of sound.

- 9.3.2 The extent of the Study Area has been informed by a review of the maximum parameters of the Proposed Development, desk-based research, the routeing and siting work undertaken to date knowledge of the area and professional judgement. The Study Area will be further refined at the

detailed assessment stage to ensure a proportionate approach, focused on potential significant effects which takes into account the location of other design elements whose positioning is subject to further design work.

9.4 Baseline Environment

- 9.4.1 An initial study of the baseline environment has been undertaken through desk-based research and is presented in Table 9-12.
- 9.4.2 The baseline environment description identifies noise sensitive receptors, indicating their location and sensitivity, against which potential changes arising from the development of the Proposed Development will be assessed. Noise sensitive receptors include residential properties, sensitive commercial and community uses (including educational premises, medical facilities, places of worship etc.) and public open spaces (including Public Rights of Way (PRoW)). The baseline environment in relation to ecology and heritage receptors are considered within Chapter 6: Biodiversity and Chapter 10: Historic Environment.
- 9.4.3 Key sources of information for the noise and vibration assessment include:
- OS mapping;
 - OS AddressBase Plus data; and
 - Department for Environment, Food and Rural Affairs (Defra) Strategic noise mapping.
- 9.4.4 The initial baseline, focusing on residential properties and community areas, is presented in Table 9-6 to Table 9-13. The baseline will be further refined at the assessment stage to account for all noise sensitive receptors within the Study Area including non-residential properties and public open spaces.

Table 9-5: Noise and Vibration Environment – Breedon Capture Facility

Noise and Vibration Baseline Environment – Breedon Capture Facility	
Baseline	
The existing sources of noise near the proposed Breedon Capture Facility include the cement plant (mills, kilns, mechanical and electrical machinery), quarrying activities and railway sidings, as well as adjacent industrial activities. Surrounding the Study Area there is existing road and rail traffic noise from the A6187 to the north, the B6049 to the east and the railway line to the north-east.	
Sensitive Receptors	
There are several communities with noise sensitive receptors (including Eden Tree Caravan site and Laneside Caravan Park) located within the construction noise Study Area, including Castleton, Hope, Brough, Bradwell and Smalldale. A number of farm and residential buildings and several outdoor recreational facilities including Hope Golf Club are located within the operational noise Study Area.	

Table 9-6: Noise and Vibration Baseline Environment – Tarmac Capture Facility

Noise and Vibration Baseline Environment – Tarmac Capture Facility
Baseline
The existing sources of noise near the proposed Tarmac Capture Facility include the cement plant (mills, kilns, mechanical and electrical machinery), quarrying activities and railway sidings, industrial activities near Watterswallows Road/ Watterswallows Lane
Sensitive Receptors
There are very few noise sensitive receptors located within the construction noise Study Area. A small number of farm and residential buildings are located within the operational noise Study Area.

Table 9-7: Noise and Vibration Baseline Environment – Buxton Lime Capture Facility

Noise and Vibration Baseline Environment – Buxton Capture Facility
Baseline
The existing sources of noise near the proposed Buxton Lime Capture Facility include mechanical and electrical machinery and road and rail movements.
Sensitive Receptors
There are very few noise sensitive receptors located within the construction noise Study Area. The community of Upper End and Peak Dale are located within the operational noise Study Area.

Table 9-8: Noise and Vibration Baseline Environment – Holcim Capture Facility

Noise and Vibration Baseline Environment – Holcim Capture Facility
Baseline
The existing sources of noise near the proposed Holcim Capture Facility include the cement plant (mills, kilns, mechanical and electrical machinery), quarrying activities and vehicle movements, as well as adjacent industrial activities. To the north of the Study Area there is existing road traffic noise from the A523.
Sensitive Receptors
There are two communities with noise sensitive receptors located within the construction noise Study Area including Cauldon to the west and Waterhouses to the north. A small number of farm and residential buildings are also located within the operational noise Study Area.

Table 9-9: Noise and Vibration Baseline Environment – Pipeline East

Noise and Vibration Baseline Environment – Pipeline East
Baseline
The existing sources of noise in the Study Area consist of A623, A6, A523, A537, A563, A53, A523, railway lines, local roads and local industrial and agricultural noise sources.
Sensitive Receptors

Noise and Vibration Baseline Environment – Pipeline East

There are several communities with noise sensitive receptors located within the construction noise Study Area including Smalldale, Peak Forest, Dove Holes, Peak Dale, Upper End, Chapel-en-le-Frith, Cockyard, Tunstead Milton, Hilltop, Hockerley, Bridgemont, Clark Green, Whiteley Green, Prestbury, Adder's Moss, Whirley Grove, Longmoss, Henbury, Weston, Moss Houses, Gawsorth, North Rode, Key Green, Timbersbrook, Newtown, Ryecroft, Abbey Green, Haregate, Bradnop, Morridge Side, Blackbrook, Winkhill, Waterhouses, and Cauldon. Between these communities there are farm and residential buildings and several outdoor recreational facilities that are within the construction noise Study Area.

Table 9-10: Noise and Vibration Baseline Environment – Pipeline Central

Noise and Vibration Baseline Environment – Pipeline Central

Baseline

The existing sources of noise in the Study Area consist of A34, A535, A50, M6, A54, A553, A530, A51, A49, A41, M53, M56, railway lines, local roads and local industrial and agricultural noise sources.

Sensitive Receptors

There are several communities with noise sensitive receptors located within the construction noise Study Area including Gleadsmoss, Swettenham, Kermincham, Twemlow Green, Cranage, Holmes Chapel, Stanthorne, Wimboldsley, Ocelston Green, Middlewich, Sproston, Lea Green, Cholmondeston, Barrets Green, Alpraham, Tilstone Fearnall, Tilstone Bank, Four Lane Ends, Tiverton, Hand Green, Brassey Green, Huxley, Waverton, Christleton, Guilden Sutton, Hoole Village, Wervin, Croughton, and Chorlton-by-Backford. Between these communities there are farm and/or residential buildings and several outdoor recreational facilities that are within the construction noise Study Area.

Table 9-11: Noise and Vibration Baseline Environment – Pipeline West

Noise and Vibration Baseline Environment – Pipeline West

Baseline

The existing sources of noise in the Study Area consist of M53, M56, A494, A550, A540, A553, railway lines, local roads and local industrial and agricultural noise sources.

Sensitive Receptors

There are several communities with noise sensitive receptors located within the construction noise Study Area including Backford, Dunkirk, Two Mills, Capenhurst, Ledsham, Little Sutton, Willaston, Windle Hill, Hooton, Raby, Thornton Hough, Brimstage, Thingwall, Irby, Irby Hill, Frankby, Saughall Massie, Meols, and Moreton. Between these communities there are farm and residential buildings and several outdoor recreational facilities that are within the construction noise Study Area.

Table 9-12: Noise and Vibration Baseline Environment – Coastal AGI to MLWS Pipeline(s)

Noise and Vibration Baseline Environment – Coastal AGI to MLWS Pipeline(s)
Baseline
The existing sources of noise in the Study Area consist of the railway line, local roads and local industrial and agricultural noise sources.
Sensitive Receptors
The two communities with noise sensitive receptors located within the construction noise Study Area include Meols and Moreton. Between these communities there are farm and residential buildings and several outdoor recreational facilities that are within the construction noise Study Area.

Table 9-13: Noise and Vibration Baseline Environment – Coastal AGI

Noise and Vibration Baseline Environment – Coastal AGI
Baseline
The existing sources of noise in the Study Areas consist of the railway line, local roads and local industrial and agricultural noise sources.
Sensitive Receptors
The communities with noise sensitive receptors located within the construction and operational noise Study Areas include Meols, Moreton, West Kirby and Greasby. Between these communities there are farm and residential buildings, light industrial buildings and several outdoor recreational facilities.

9.5 Identification of Potential Effects

9.5.1 Potential effects arising from the Proposed Development in relation to noise and vibration will include the following.

Construction

- Temporary noise effects due to construction equipment and activities, in particular potentially noisy activities e.g. directional drilling at watercourse, rail or road crossings, which need to take place close to sensitive receptors and/or during the night-time;
- Temporary vibration effects due to construction equipment and activities with the potential to generate substantial levels of vibration such as piling, excavation, compaction or demolition; and
- Temporary noise effects from additional vehicle movements such as heavy goods vehicles (HGV), mobile machinery, construction related vehicles accessing construction compounds from the surrounding road network and vehicles on haul roads within the construction site may occur.

Operation

- Long term effects associated with the operation of mechanical plant at the Capture Facilities. Noise from these sources has the potential to give rise to significant adverse effects at individual dwellings and communities; and

- Long term effects associated with the operation of mechanical and electrical plant at the Coastal AGI. Noise from these sources has the potential to give rise to effects at individual dwellings and communities.

Decommissioning

- Temporary noise effects from decommissioning activities, due to construction equipment and in particular, demolition activities, which need to take place close to sensitive receptors;
- Temporary vibration effects due to construction equipment and activities with the potential to generate substantial levels of vibration such as compaction or demolition; and
- Temporary noise effects from additional vehicle movements such as heavy goods vehicles (HGV), mobile machinery, and construction related vehicles accessing the demolition site.

9.6 Scope and Methodology

- 9.6.1 This section outlines the scope and methodology that will be employed for assessing the likely significant effects of noise and vibration on human receptors and buildings. The scope and methodology for assessing the effects of noise and vibration on ecology and heritage receptors are considered within Chapter 6: Biodiversity and Chapter 10: Historic Environment.

Scope

- 9.6.2 Potential noise and vibration impacts to be considered are construction (including demolition) noise and vibration, construction (including demolition) road traffic noise, noise from operation of the Proposed Development, and road traffic noise associated with operation of the Proposed Development and decommissioning.

Methodology

- 9.6.3 This section outlines the methodology that is proposed to be used for the noise and vibration assessment building on the general assessment methodology presented in Chapter 4. The assessment will be carried out in accordance with the standards and guidance listed in Section 9.1.

Sensitivity

- 9.6.4 Guidance from DMRB LA 111 (Ref 9-23) and the IEMA 'Guidelines for Environmental Noise Impact Assessment' (Ref 9-24) acknowledges that receptors may exhibit varying sensitivities to noise, although a specific sensitivity scale is not defined.
- 9.6.5 Noise Sensitive Receptors (NSRs) are determined partly on property type, for example residential properties are of a higher sensitivity than factories and offices. The sensitivity of residential NSRs is factored into the assessment criteria for noise and vibration impacts.
- 9.6.6 The sensitivity of a residential NSR may also depend on the pre-existing noise climate. For example, those NSR which fall within an existing high noise area such as a roads Noise Important Area (NIA) may be more sensitive to increases in noise. Consideration of such instances would be given within the assessment of construction traffic.
- 9.6.7 The various guidance documents referenced in Section 9.1 provide different assessment criteria for different receptor types. Accordingly, receptor sensitivity has been considered in the selection of assessment criteria used to describe the magnitude of impact. A separate sensitivity scale for noise receptors is therefore not required.

- 9.6.8 Some specialist facilities may have higher sensitivity to vibration than residential properties, for example hospitals, research laboratories and precision manufacturing. The Study Areas will be reviewed for such facilities in relation to the construction works and receptor-specific assessment criteria developed where required. Vibration from operation of the Proposed Development is expected to be negligible.

Magnitude of Change

- 9.6.9 Noise impacts are assessed in terms of the magnitude of change from the baseline sound level and in terms of the absolute levels of sound. Vibration is only assessed as absolute levels since there is generally no baseline vibration perceptible.
- 9.6.10 Magnitude of change in relation to noise and vibration refers to the extent to which the Proposed Development will alter the existing acoustic environment.
- 9.6.11 The Noise Policy Statement for England (Ref 9-35) introduces the concepts of Lowest Observed Adverse Effect Level (LOAEL) and Significant Observed Adverse Effect Level (SOAEL) as absolute levels. For the purposes of this assessment, these concepts are assumed to apply to both noise and vibration.
- 9.6.12 NPSE defines:
- NOEL (No Observed Effect Level): the level below which no effect can be detected;
 - LOAEL: the level above which adverse effects on health and quality of life can be detected;
 - SOAEL: the level above which significant adverse effects on health and quality of life occur; and
 - LOAEL and SOAEL criteria are not defined in government policy and will be defined and applied to residential receptors. Should other receptor types or unusual local circumstances be identified, other criteria may also be set.
- 9.6.13 The levels of magnitude for noise and vibration are described as being high or major, medium or moderate, low or minor and negligible and are defined differently depending on the context that is being assessed and the applicable guidance. The magnitude scale is applicable to the range of receptors presented. Should other receptor types or unusual local circumstances be identified, reference will be made to other absolute noise criteria, such as those presented by BS 8233 and the WHO. The levels and definitions are given in Table 9-14 to Table 9-20.
- 9.6.14 Table 9-14 presents magnitudes of impact for construction noise based upon the example threshold for a potential significant effect at dwellings presented in Table E.1 of BS 5228-1 (Ref 9-11). The Category A thresholds have been adopted as the LOAEL values for the assessment of construction noise at residential properties. The Category C threshold values, or the ambient noise level, whichever is the higher, have been adopted as the SOAEL values for the assessment of construction noise at residential properties. During the day, evening or night, a construction noise potential significant effect on a receptor will be identified where the impact of the proposed development is greater than the relevant assessment category value.

Table 9-14: Magnitude of impact of construction noise at residential receptors

Reference Period	Threshold value dB $L_{Aeq,T}$ (façade)		
	Category A (A)	Category B (B)	Category C (C)
Weekday daytime (07:00-19:00) Saturdays (07:00-13:00)	65	70	75
Weekday evenings (19:00- 23:00) Saturdays (13:00-23:00) Sundays (07:00-23:00)	55	60	65
Night-time (23:00-07:00)	45	50	55
Weekday daytime (07:00-19:00) Saturdays (07:00-13:00)	65	70	75
Weekday evenings (19:00- 23:00) Saturdays (13:00-23:00) Sundays (07:00-23:00)	55	60	65
Night-time (23:00-07:00)	45	50	55

Notes:

(A) Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are less than these values.

(B) Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are the same as category A values.

(C) Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are higher than category A values.

Note 1: A potential significant effect is indicated if the $L_{Aeq,T}$ noise level arising from the site exceeds the threshold level for the category appropriate to the ambient noise level.

Note 2: If the ambient noise level exceeds the Category C threshold values given in the table (i.e. the ambient noise level is higher than the above values), then a potential significant effect is indicated if the total $L_{Aeq,T}$ noise level for the period increases by more than 3 dB due to site noise.

Table 9-15: Magnitude of impact of human response to construction vibration (including tunnelling) at residential receptors

Magnitude	Impact
High	Above or equal to 10 mm/s PPV
Medium	Above or equal to 1.0 mm/s PPV (SOAEL) and below 10mm/s PPV (LOAEL)
Low	Above or equal to 0.3 mm/s PPV (LOAEL) and below 1.0mm/s PPV (SOAEL)
Negligible	Below 0.3 mm/s PPV (LOAEL)

Table 9-16: Magnitude of impact of structural damage due to construction vibration

Category of Building	PPV mm/s – at building foundation	
	Transient (1) vibration	Continuous (2) vibration
Potentially vulnerable buildings ⁽³⁾	6	3
Structurally sound buildings	12	6

Notes:

(1) Transient vibration relative to building response such as impulsive vibration from percussive piling.

(2) Continuous vibration relative to building response such as vibrating rollers.

(3) BS 7385 highlights that the criteria for aged buildings may need to be lower if the buildings are structurally unsound. The standard also notes that criteria should not be set lower simply because a building is important or historic (listed). Properties shall be considered structurally sound, unless stated otherwise.

Table 9-17: Magnitude of impact of construction road traffic noise

Magnitude	Change in Basic Noise Level (BNL) resulting from construction road traffic noise		
	Where BNL is less than LOAEL of 55 dB LA10,18hr façade (equivalent to 53 dB L _{Aeq,T})	Where BNL is between LOAEL and SOAEL	Where BNL is more than SOAEL of 68 dB LA10,18hr façade (equivalent to 66 dB L _{Aeq,T})
High	-	Greater than or equal to 10.0 dB	Greater than or equal to 5.0 dB
Medium	-	Greater than or equal to 5.0 dB and less than 10.0 dB.	Greater than or equal to 3.0 dB and less than 5.0 dB.
Low	-	Greater than or equal to 3.0 dB and less than 5.0 dB.	Greater than or equal to 1.0 dB and less than 3.0 dB.
Negligible	Any	Less than 3.0 dB	Less than 1.0 dB.

Table 9-18: Magnitude of impact – residential site suitability

Magnitude	On-site external noise levels	
	Daytime (07:00 – 23:00) L _{Aeq} ,16hr dB	Night-time (23:00 – 07:00) L _{Aeq} ,8hr dB
High	>70	<60
Medium	61 to 70	51 to 60
Low	50 to 61	40 to 50
Negligible	<50	<40

Table 9-19: Magnitude of impact – operational road traffic noise

Magnitude	Short-term Noise Change (dB L _{A10,18hr} or L _{night})	Long-term Noise Change (dB L _{A10,18hr} or L _{night})
High	Greater than or equal to 5.0	Greater than or equal to 10.0
Medium	3.0 to 4.9	3.0 to 4.9
Low	1.0 to 2.9	1.0 to 2.9
Negligible	Less than 1.0	Less than 1.0

Table 9-20: Magnitude of impact - operational noise from fixed installations

Magnitude	Difference between background sound level and rating noise level in accordance with BS 4142
High	More than or equal to +10 dBA
Medium	Greater than or equal to +5 and less than +10 dBA
Low	Greater than or equal to 0 and less than +5 dBA
Negligible	Below background (L _{A90,T})

Significance of effects

- 9.6.15 Where the predicted noise or vibration level exceeds the relevant SOAEL values then a likely significant adverse effect will be reported for each receptor affected.
- 9.6.16 For residential receptors, likely significant adverse effects (positive from noise reductions and negative from noise or vibration increases) will also be determined on a community basis where the calculated level exceeds the relevant LOAEL but is less than the relevant SOAEL values by taking into account the following factors:
- Type of effect being considered (e.g. annoyance);
 - The magnitude of the effect (i.e. the calculated sound or vibration level compared to the relevant LOAEL and SOAEL values and available dose response information);
 - Change in sound level;
 - The assessment category;
 - The existing sound environment in terms of the absolute level and the character of the existing environment;

- The number and grouping of receptors subject to noise effect and noise change;
- Any unique features of the project or the receiving environment;
- The potential combined impacts of sound and vibration; and
- The frequency and duration over which temporary construction impacts may occur.

9.6.17 For non-residential receptors, significant effects will be determined on a receptor-by-receptor basis taking into account:

- The use and sensitivity of the receptor;
- The type of effect being considered;
- Whether the calculated magnitude of noise or vibration exceed the screening criteria;
- The design of the receptor affected;
- The existing ambient sound and vibration levels in the receptor affected;
- The potential combined impacts of airborne sound, ground-borne sound and vibration;
- Any unique features of the project's sound or vibration impacts in the area being considered (which may require secondary acoustic indicators / criteria); and
- The frequency and duration over which temporary construction impacts may occur.

9.6.18 An assessment of the magnitude of change for acoustic environments is then made by combining the above considerations with guidance and evidence and comparing that against the existing baseline environment.

Consultation

9.6.19 Consultation will be held with relevant LPAs and statutory consultees early in the noise and vibration assessment process. This will help to inform detailed baseline survey and data collection which will form the basis of the visual assessment; and, to agree the approach to mitigation measures.

Assumptions and Limitations

9.6.20 The assessment of construction noise and vibration impacts and operational noise impacts will be undertaken using the Peak Cluster Pipeline/ Capture Facilities design and construction information available at the time of assessment. It may be necessary for proxy noise sources to be used and technical assumptions to be made, in order to allow an assessment to be undertaken.

9.6.21 Baseline noise monitoring is proposed at a representative number of locations in the vicinity of the Study Area. However, obtaining permission from landowners or residents to access the monitoring locations would be necessary and, as such, there is a risk that monitoring would not be possible at all of the identified locations. The Cumulative Effects Assessment (CEA) will be based on information provided by promoters of other developments which is readily available in the public domain. Where this information is not available, the CEA is to be based on the professional judgement of the assessor.

Summary of issues to be scoped in / out

9.6.22 A summary of the issues to be scoped in or out of the noise and vibration assessment is presented in Table 9-21 to Table 9-23.

Table 9-21: Noise and Vibration Scope – Capture Facilities

Noise and Vibration Scope – Capture Facilities				
Scope Scoped in ✓, scoped out ✗	Construction (C), Operation (O), Decommissioning (D)			Rationale
	C	O	D	
Noise	✓	✓	✓	Noise from construction activities, decommissioning activities and operation of the Capture Facilities has the potential to result in significant effects at sensitive receptors.
Vibration	✓	✗	✓	Vibration from construction activities and decommissioning activities of the Capture Facilities has the potential to result in significant effects at sensitive receptors.
Noise from road traffic	✓	✗	✓	Noise from construction traffic operating on the public road network has the potential to result in temporary significant effects at the sensitive receptors. Road traffic movements associated with the operation of the capture facilities are expected to be minimal and not likely to result in significant effects.

Table 9-22: Noise and Vibration Scope – Peak Cluster Pipeline

Noise and Vibration – Peak Cluster Pipeline				
Scope Scoped in ✓, scoped out ✗	Construction (C), Operation (O), Decommissioning (D)			Rationale
	C	O	D	
Noise	✓	✓	✓	Noise from construction and decommissioning of the Peak Cluster Pipeline and operating the associated infrastructure has the potential to result in significant effects at sensitive receptors.
Vibration	✓	✗	✓	Vibration from constructing and decommissioning the pipeline has the potential to result in significant effects at sensitive receptors.

Noise and Vibration – Peak Cluster Pipeline				
Noise from road traffic	✓	✗	✓	Noise from construction traffic operating on the public road network is unlikely to result in temporary significant effects at the sensitive receptors. Road traffic movements associated with the operation of the Peak Cluster Pipeline are expected to be minimal and not likely to result in significant effects.

Table 9-23: Noise and Vibration Scope – Coastal AGI to MLWS Pipeline(s)

Noise and Vibration – Coastal AGI to MLWS Pipeline				
Scope Scoped in ✓, scoped out ✗	Construction (C), Operation (O), Decommissioning (D)			Rationale
	C	O	D	
Noise	✓	✓	✓	Noise from construction and decommissioning of the Coastal AGI to MLWS Pipeline and operating of the associated infrastructure has the potential to result in significant effects at sensitive receptors.
Vibration	✓	✗	✓	Vibration from construction and decommissioning of the Coastal AGI to MLWS Pipeline has the potential to result in significant effects at sensitive receptors.
Noise from road traffic	✓	✗	✓	Noise from construction traffic operating on the public road network has the potential to result in temporary significant effects at the sensitive receptors. Road traffic movements associated with the operation of the Coastal AGI to MLWS Pipeline are expected to be minimal and not likely to result in significant effects.

9.7 Planned Surveys

- 9.7.1 Baseline sound surveys will be carried out to establish the sound environment within the Study Area and to define the baseline levels representative of surrounding noise sensitive receptors. Surveys will be carried out post-scoping following the agreement of their scope and methodology with the Environmental Health Officers at the relevant Local Authorities including Cheshire West and Cheshire East, Wirral Council, High Peak Derbyshire Dales District Council and Staffordshire Moorlands Council, Derbyshire County Council and Staffordshire County Council. Suitable locations for monitoring will be agreed and will take into consideration the safety of the operators, security of monitoring equipment and accessibility.
- 9.7.2 At this stage it is anticipated that attended daytime site surveys will be undertaken near residential buildings in each of the communities listed in section 9.3 that are within the Study Area (up to 100 locations). These surveys would include observations of the existing and potential future sources

of noise in the receiving environment. Most sound survey locations would include short term daytime sound level measurements to supplement observations and on-line noise mapping data. In certain locations, such as those close to existing sources of sound, near locations that may require evening or night-time construction works, or near proposed 24 hour operational fixed installation noise sources, longer term unattended noise monitoring will be undertaken to obtain representative data for day, night, weekday and weekend periods.

9.8 Mitigation

- 9.8.1 Mitigation measures are undertaken as a response to anticipated adverse noise and vibration effects. Embedded mitigation (often also referred to as mitigation by design) are steps taken during the design phase to help minimise potential effects, based on key sensitivities, constraints and opportunities identified through baseline study and informed by Best Practicable Means (BPM) (as defined by Section 72 of the Control of Pollution Act 1974 (Ref 9-37)). Noise and vibration considerations will continue to inform the design, layout and routeing of the various elements throughout the design process.
- 9.8.2 Project specific mitigation are those additional measures that seek to further reduce potential effects that could not be entirely designed out and are identified and informed by the detailed assessment stage (also referred to as Additional Mitigation). These could include temporary screening bunds between construction works and noise sensitive properties.
- 9.8.3 Noise would be generated by various sources at the above ground infrastructure sites, including several mechanical and electrical systems. Mitigation of noise emissions from such sources would be controlled through various design / management measures, as appropriate, which may include enclosures, barriers, muffling devices and vibration isolation measures.

9.9 Summary

- 9.9.1 The noise and vibration assessment will be undertaken in accordance with the Noise Policy Statement for England (Ref 9-35) and Planning Practice Guidance for Noise (Ref 9-7) as well as current good practice guidance.
- 9.9.2 Baseline surveys will be carried out to establish the sound environment within the Study Area and representative of surrounding NSR. The methodology will be agreed with the Local Authorities and will be presented together with the results in the ES.
- 9.9.3 Mitigation measures will be developed and informed by the detailed baseline and assessment stages and will seek to minimise potential adverse effects. This will focus on design and management measures to avoid or reduce adverse effects.
- 9.9.4 As there is the potential for noise and vibration effects to occur during construction and decommissioning due to works activities and construction-related traffic, further detailed assessment will be included within the ES. An assessment of the operational noise associated with the Capture Facilities would also be included. It is not expected that significant noise or vibration effects due to operational road traffic will occur and thus these noise sources have been scoped out.

9.10 References

- Ref 9-1** HMSO. Environmental Protection Act (EPA) 1990. Available at: <https://www.legislation.gov.uk/ukpga/1990/43/contents>
- Ref 9-2** HM Government (1974). Control of Pollution Act (COPA) 1974. Available at: <https://www.legislation.gov.uk/ukpga/1974/40>
- Ref 9-3** HM Government (2008). The Planning Act 2008. Available at: <https://www.legislation.gov.uk/ukpga/2008/29/contents>
- Ref 9-4** Department of Energy Security and Net Zero (2025). Overarching National Policy Statement for Energy EN-1. Available at: <https://assets.publishing.service.gov.uk/media/68093d68148a9969d2394f59/draft-nps-en-1.pdf>
- Ref 9-5** Department of Energy & Climate Change (2024). National Policy Statement for Natural Gas Electricity Generating Infrastructure (EN-2). Available at: <https://assets.publishing.service.gov.uk/media/65a787fc640602000d3cb7c0/nps-natural-gas-electricity-generating-infrastructure-en2.pdf>
- Ref 9-6** Department of Energy & Climate Change (2004). National Policy Statement for Natural Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4). Available at: <https://www.gov.uk/government/publications/national-policy-statement-for-natural-gas-supply-infrastructure-and-gas-and-oil-pipelines-en-4/national-policy-statement-for-natural-gas-supply-infrastructure-and-gas-and-oil-pipelines-en-4>
- Ref 9-7** Ministry of Housing, Communities and Local Government (2023). National Planning Policy Framework. Available at: <https://www.gov.uk/government/publications/nationalplanning-policy-framework--2>
- Ref 9-8** Department for Environment, Food and Rural Affairs (Defra) (2010). Noise Policy Statement for England. NPSE, London: Defra.
- Ref 9-9** Ministry of Housing, Communities and Local Government (MHCLG) (2019). Planning Practice Guidance – Noise. s.l.: MHCLG.
- Ref 9-10** Department for Environment, Food and Rural Affairs (Defra) (2010), (2019a). Noise Action Plan: Roads. Available at: <https://assets.publishing.service.gov.uk/media/5d1aec5540f0b609da30d3a4/noise-actionplan-2019-roads.pdf>
- Ref 9-11** Cheshire West and Chester Council (2019). Local Plan (Part One and Part Two) Available at: <https://www.cheshirewestandchester.gov.uk/your-council/policies-and-performance/council-plans-policies-and-strategies/planning-policy/local-plan>
- Ref 9-12** Cheshire East Council (2017 & 2022). Local Plan Strategy (2017) and Site Allocations and Development Policies Document (SADPD, 2022) Available at: <https://www.cheshireeast.gov.uk/localplan>
- Ref 9-13** Wirral Metropolitan Borough Council (2025). Wirral Local Plan 2022–2040 (Adopted March 2025) Available at: <https://www.wirral.gov.uk/localplan>

- Ref 9-14** High Peak Borough Council (2016). High Peak Local Plan 2016–2031 (Adopted April 2016)
Available at: <https://www.highpeak.gov.uk/article/646/The-Adopted-Local-Plan-2016>
- Ref 9-15** Staffordshire Moorlands District Council (2020). Staffordshire Moorlands Local Plan 2014–2033 (Adopted September 2020) Available at:
<https://www.staffsmoorlands.gov.uk/LocalPlan>
- Ref 9-16** BSI (2019). BS 4142:2014 + A1:2019 Methods for rating and assessing industrial and commercial sound. London: British Standards Institution.
- Ref 9-17** BSI (2014c). BS 8233:2014 Guidance on sound insulation and noise reduction for buildings. London: BSI.
- Ref 9-18** BSI (2014b). BS 5228-2:2009 +A1:2014 Code of practice for noise and vibration control on construction and open sites - Part 2: Vibration. London: British Standards Institution.
- Ref 9-19** BSI (2003). BS 7445:2003 Description and measurement of environmental noise - Part 1: Guide to quantities and procedures. London: British Standards Institution.
- Ref 9-20** BSI (2008). BS 6472:2008 Guide to evaluation of human exposure to vibration in buildings. London: BSI.
- Ref 9-21** BSI (1993). BS 7385-2:1993 Evaluation and measurement for vibration in buildings - Guide to damage levels from groundborne vibration. London: British Standards Institution.
- Ref 9-22** ISO (2024). ISO 9613-2:2024 Acoustics — Attenuation of sound during propagation outdoors, Part 2: Engineering method for the prediction of sound pressure levels outdoors. s.l.: International Organisation for Standardisation.
- Ref 9-23** Highways England (2020). Design Manual for Roads and Bridges (DMRB) LA 111 – Noise and vibration, Rev 2. London: Highways England.
- Ref 9-24** Institute of Environmental Management and Assessment (IEMA) (2014). Guidelines for Environmental Noise Impact Assessment. s.l.: Institute of Environmental Management & Assessment.
- Ref 9-25** Association of Noise Consultants (ANC) (2012). ANC Guidelines, measurement & assessment of groundborne noise & vibration. Suffolk, Lavenham Press: The Association of Noise Consultants.
- Ref 9-26** ANC (2023). Construction Noise - A good practice guide to the preparation, submission and management of Section 61 consents. ANC.
- Ref 9-27** ANC, IOA, CIEH, (2017). Professional Practice Guidance (ProPG): Planning & Noise. s.l.:
- Ref 9-28** ISO (2005). ISO 14837-1:2005 Mechanical vibration — Ground-borne noise and vibration arising from rail systems, Part 1: General guidance. s.l.: International Organisation for Standardisation.
- Ref 9-29** Department of Transport (DoT) (1995). Calculation of Railway Noise. London:
- Ref 9-30** WHO (1999). Guidelines for Community Noise, s.l.: World Health Organisation Regional Publications, European Series.

- Ref 9-31** Institute of Environmental Management and Assessment (IEMA) (2022). Determining Significance For Human Health In Environmental Impact Assessments s.l.: Institute of Environmental Management & Assessment.
- Ref 9-32** Institute of Environmental Management and Assessment (IEMA) (2022). Effective Scoping of Human Health in Environmental Impact Assessment. s.l.: Institute of Environmental Management & Assessment.
- Ref 9-33** Waddington, D. et al. (2005) Procedure for the assessment of low frequency noise disturbance (NANR45).
- Ref 9-34** Association of Noise Consultants (ANC), Institute of Acoustics (IOA), Chartered Institute of Environmental Health (CIEH).
- Ref 9-35** Ministry of Housing, Communities and Local Government (2023). National Planning Policy Framework. Available at: <https://www.gov.uk/government/publications/nationalplanning-policy-framework--2>
- Ref 9-36** BSI (2014a). BS 5228-1:2009 +A1:2014 Code of practice for noise and vibration control on construction and open sites - Part 1: Noise. British Standards Institution: London.
- Ref 9-37** HM Government (1974). Control of Pollution Act (COPA) 1974. Available at: <https://www.legislation.gov.uk/ukpga/1974/40>
- Ref 9-38** Extrium, (n.d.). England Noise and Air Quality Viewer. Available at: <http://extrium.co.uk/noiseviewer.html>
- Ref 9-39** Department for Levelling Up, Housing and Communities (DLUHC) (2022). Overheating: Approved Document O, The Building Regulations 2010. s.l.: Department for Levelling Up, Housing and Communities.
- Ref 9-40** New, B. M. (1986). Ground vibration caused by civil engineering works. Research Report 53, Wokingham: Transport and Roads Research Laboratory (TRRL).
- Ref 9-41** SP Energy Networks (2017). Reinforcement to North Shropshire Electricity Distribution Network: 132kV Wood Pole Overhead Line from Oswestry to Wem Scoping Report, s.l.: s.n.
- Ref 9-42** Future Oxfordshire Partnership (2021). Oxfordshire's Strategic Vision for Long-Term Sustainable Development. Available at: <https://www.oxford.gov.uk/downloads/file/3012/gro-013-oxfordshirestrategicvision#:~:text=We%20want%20Oxfordshire%20to%20thrive,%2C%20social%2C%20and%20economic%20wellbeing>
- Ref 9-43** The Planning Inspectorate (2017). Scoping Opinion Proposed Reinforcement to North Shropshire Electricity Distribution Network. Planning Inspectorate Reference: EN020021, s.l.: s.n.
- Ref 9-44** Department for Environment, Food and Rural Affairs (Defra) (2010), (2019b). North Wessex Downs Area of Outstanding Natural Beauty, Management Plan 2019-2024. Available at: https://www.northwessexdowns.org.uk/wpcontent/uploads/2021/11/NWDAONB_Management_Plan_2019-24_low_res_32Mb.pdf

- Ref 9-45** Department of Transport and the Welsh Office, (1988). Calculation of Road Traffic Noise. s.l.: HMSO.
- Ref 9-46** British Steel & General Steels (1986). Legislation and practice on noise and vibration control with particular relevance to piling, s.l.: s.n.
- Ref 9-47** WHO (2009). Night Noise Guidelines for Europe, s.l.: World Health Organisation.
- Ref 9-48** WHO (2018). Environmental Noise Guidelines for the Region. Available at:
<https://www.who.int/europe/publications/i/item/9789289053563>
- Ref 9-49** Department for Environment, Food and Rural Affairs (Defra) (2010), (2014). Possible options for the identification of SOAEL and LOAEL in support of the NPSE. Glasgow: Defra.

10. Historic Environment

10.1 Introduction

- 10.1.1 This chapter of the Scoping Report presents an initial baseline for the historic environment, identifies the need for additional surveys to ensure information is appropriate to accurately characterise the baseline and sets out the Study Areas for assessment. In addition, the chapter provides an overview of the assessment methodology to be followed for the environmental assessment and identifies the potential effects.
- 10.1.2 The historic environment comprises above and below-ground archaeological remains, buildings or structures of historic interest, historic landscape character and historic landscape features, including historically important hedgerows, and any other elements that are of historic environmental interest.
- 10.1.3 Historic environment aspects considered within this Scoping chapter comprise designated heritage assets, including:
- World Heritage Sites;
 - Scheduled Monuments;
 - Listed Buildings;
 - Registered Parks and Gardens;
 - Registered Battlefields;
 - Protected Wrecks; and
 - Conservation Areas.
- 10.1.4 Non-designated heritage assets, historic landscape character and other historic environment records will be considered and presented within the PEIR.
- 10.1.5 This chapter is supported by Figure 10-1 which shows the location of designated heritage assets and Appendix H which contains baseline tables.

10.2 Legislation, Policy and Guidance

- 10.2.1 A brief overview of the policy, legislative and guidance relevant to the historic environment assessment is provided in the tables below.

Table 10-1: Relevant Legislation

Legislation
Ancient Monuments and Archaeological Areas Act 1979 (Ref 10-1)
Planning (Listed Buildings and Conservation Areas) Act 1990 (Ref 10-2)
The Hedgerows Regulations 1997 (Ref 10-3)
The Infrastructure Planning (Decisions) Regulations 2010, Section 3 (Ref 10-4)

Table 10-2: Relevant National Policies, Plans and Strategies

National Policy
Overarching National Policy Statement for Energy (EN-1) (Ref 10-5)
National Planning Policy Framework 2025 (Ref 10-7)

Table 10-3: Relevant Local Policy

Local Policy
Peak District National Park Local Development Framework (Adopted October 2011) (Ref 10-8)
High Peak District Local Plan (Adopted 2016) (Ref 10-13)
Adopted Derbyshire Dales Local Plan (Adopted 2017) (Ref 10-14)
Staffordshire Moorlands District Local Plan 2014-2033 (Adopted 2020) (Ref 10-15)
Cheshire East Local Plan 2010-2030 (Adopted 2017) (Ref 10-12)
Cheshire West and Chester Local Plan Part One – Strategic Policies (Adopted 2015) (Ref 10-10)
Cheshire West and Chester Local Plan Part Two – Land Allocations and Detailed Policies (Adopted 2019) (Ref 10-11)
Wirral Local Plan 2022 to 2040 (Adopted 2025) (Ref 10-9)
Made Neighbourhood Plans (as relevant)

Table 10-4: Standards and Guidance

Standards and Guidance
Planning Practice Guidance (PPG): Historic Environment (Ref 10-16)
Historic Environment, Good Practice Advice in Planning Note 2. Managing Significance in Decision Taking in the Historic Environment. Historic England (Ref 10-17)
Historic Environment, Good Practice Advice in Planning Note 3. The Setting of Heritage Assets. Historic England (2nd edition, 2017) (Ref 10-18)
Historic Environment, Statements of Heritage Significance: Analysing Significance in Heritage Assets. Historic England Advice Note 12. Historic England (Ref 10-19)
Chartered Institute for Archaeologists (CIfA), Standard and Guidance for Historic Environment Desk-Based Assessment (Ref 10-20)
CIfA, Code of Conduct: professional ethics in archaeology (Ref 10-21)
Institute of Environmental Management and Assessment (IEMA), Institute of Historic Building Conservation (IHBC) and CIfA, Principles of Historic Environment Impact Assessment in the UK (Ref 10-22)

10.3 Defining the Study Area

Consultation and engagement

- 10.3.1 Initial briefings have taken place between Peak Cluster Ltd and Historic England and the LPAs. Further detailed consultation will be undertaken with Historic England and the historic environment advisors to the relevant LPAs following submission of this scoping report.

Defining the study and survey areas

- 10.3.2 The Study Area is defined as the area within which historic environment assets may experience effects as a result of the Proposed Development during construction, operation and / or decommissioning. Effects to heritage assets may arise as a result of physical impacts or through change to their setting.
- 10.3.3 The Study Areas defined below take account of the guidance in 'The Setting of Heritage Assets: Historic Environment Good Practice Advice in Planning Note: 3' (Ref. 10-17) and 'Standard and Guidance for Historic Environment Desk-Based Assessment' (Ref. 10-19) and professional judgement and experience on other similar projects.
- 10.3.4 The Study Areas have been defined relevant to separate above ground and below ground components of the Proposed Development, as described:
- Above ground components: Capture Facilities, Peak Cluster Pipeline AGIs and BVS; Coastal AGI; and
 - Below ground components of the Proposed Development includes the pipelines: Peak Cluster Pipeline and Coastal AGI to MLWS Pipeline(s).
- 10.3.5 For the purposes of this Scoping Report, broad study areas have been identified to support the scoping of likely effects on the Historic Environment. An initial Study Area extending 1 km either side of the Scoping Boundary has been used to capture data for designated heritage assets in relation to below ground components of the Proposed Development (Figure 10-1). The initial Study Area is extended to 5 km from the Scoping Boundary for designated heritage assets in relation to above ground components of the Proposed Development. The Study Areas provide the necessary context for establishing the likely significant effects arising from the Proposed Development and the potential impacts upon historic environment assets, including those arising from changes within their settings.
- 10.3.6 For comparison, Appendix H of the Scoping Report also presents the numbers of designated heritage assets present within 5 km of the Scoping Boundary for above ground components of the Proposed Development, and within 1km of the Scoping Boundary for below ground components of the Proposed Development, as those are most likely to experience significant effects due to their proximity to the Proposed Development.
- 10.3.7 Taking into account the historic environment baseline information collated for this Scoping Report as set out in the following sections and Appendix H, a Study Area of 1km from the draft Order Limits (once established) in relation to below ground components of the Proposed Development will be taken forward for assessment in the EIA: 1km is recommended and considered proportionate as the pipeline is an entirely below ground facility so views towards construction activities will largely be limited to the immediate area, and any impacts to the setting of heritage assets will be temporary and largely restricted to the construction phase.

- 10.3.8 For above ground components of the Proposed Development, an initial Study Area of 2 km is proposed to be taken forward for assessment in the EIA, and a wider study area of up to 5 km will be proposed for assets beyond the 2 km study area that are highly sensitive to change as a result of the Proposed Development.
- 10.3.9 However, these study areas will be reviewed following consultation with statutory consultees, and after examination of the Zone of Theoretical Visibility figures (ZTV) following further design development when these are available.

10.4 Baseline Environment

Information sources

- 10.4.1 The known baseline historic environment resource described in this section has been informed by the following data sources:
- Historic England's National Heritage List for England (NHLE); and
 - Other readily available online sources.
- 10.4.2 The NHLE comprises a national database of designated heritage assets. However, data held by the NHLE for Conservation Areas is incomplete as this data is provided by Local Authorities (LAs) and, in some cases, this data has not yet been digitised and is only available as pdf versions of the original leaflets released for local use. As such, only those Conservation Areas identified on the NHLE have been considered at this early Scoping stage; these are shown on Figure 10.1. As this application progresses, provision will be made to digitise this information for inclusion in the baseline. This applies to the following Local Authorities:
- Unitary Authority of Cheshire East; and
 - Unitary Authority of Cheshire West and Chester.

Baseline Environment

- 10.4.3 The tables in Appendix H outline the baseline historic environment designated assets recorded within the 1 km and 5 km Study Areas. Each table looks at a specific aspect of the Proposed Development, with the relevant listed entry (LE) or local planning authority (LPA) referenced against each asset.

Sensitive receptors

- 10.4.4 For the purposes of this Scoping chapter, historic environment sensitive receptors have been identified within the Study Areas defined above (1 km for below ground components and 5 km for above ground components). The following designated asset types have initially been identified as potentially sensitive receptors:
- World Heritage Sites;
 - Scheduled Monuments;
 - Conservation Areas;
 - Grade I and II* Listed Buildings;
 - Grade II Listed Buildings within the Scoping Boundary;
 - Registered Parks and Gardens;

- Registered Battlefields; and
- Protected Wrecks.

10.4.5 Counts of sensitive receptors are provided in the baseline environment tables provided in Appendix H and those sensitive receptors that meet the criteria for experiencing likely significant effects are also listed.

Future Baseline

10.4.6 There is unlikely to be any change to the historic environment baseline conditions described in the previous section. Should there be any changes to the baseline in the future, this is likely to relate to the discovery of previously unknown below ground archaeology remains within the Study Area, or the addition or removal of features affecting the setting of heritage assets.

10.5 Planned Surveys

Table 10-5: Scope of Proposed Development Surveys

Survey	Scope of Survey	Survey Timings	Survey Area Extent	Justification
Historic Environment Desk-based Assessment	Collation of baseline information on designated and non-designated heritage assets and historic landscape character, identification of assets to be scoped in for assessment in the ES.	To inform compilation of PEIR and ES.	Study Areas as defined in section 10.3 of this Scoping chapter.	Requirement of EIA process, forms basis of historic environment baseline.
Heritage Walkover Survey	Site visits to view relevant designated and non-designated assets and identify additional assets not recorded in existing datasets.	To inform compilation of PEIR and ES.	Study Areas as defined in section 10.3 of this Scoping chapter, including designated and non-designated assets where setting may be affected.	Supports baseline assessment and provides contextual information.
AP/LiDAR Survey	Route wide survey of existing Lidar data and aerial photographs.	To inform compilation of ES.	Sufficient to encompass Study Area as defined in this scoping chapter.	Supports baseline assessment and provides contextual information.
Geophysical Survey	Non-intrusive survey of suitable and accessible land to identify archaeological potential.	Following confirmation of draft Order Limits, to inform compilation of ES chapter.	Suitable and accessible land within the Study Area (except areas which are not suitable e.g. hard rock areas).	Forms contextual information for assessment and informs trial trench evaluation design.

Survey	Scope of Survey	Survey Timings	Survey Area Extent	Justification
Trial Trench Evaluation	Excavation of targeted trial trenches based on DBA, AP/Lidar and geophysical survey results to prove/disprove archaeological potential and inform mitigation strategy, including avoidance by design (within limits of deviation).	Post-DCO (pre-construction) as part of an advanced archaeological works programme, including mitigation works to follow subject to stakeholder consultation.	Within the Order Limits – targeted trial trenching of areas where direct impacts are predicted including pipeline corridor (only where this interacts with significant archaeology) and, CC sites, AGI sites, access routes and compounds.	Validates DBA, geophysical and AP/Lidar surveys, provides information for assessment and supports identification of areas requiring additional mitigation measures.

10.6 Identification of Potential Effects

Construction Phase

- 10.6.1 Temporary construction impacts that would last for all or part of the construction phase of the Proposed Development are likely to include the following:
- The presence and movement of construction plant that may alter the setting of heritage assets, including change arising from noise and dust; and
 - The presence of construction compounds which may change the setting of heritage assets as a result of noise or light intrusion.
- 10.6.2 Permanent construction impacts that would last beyond the construction phase are likely to include:
- Physical impacts to known and previously unknown buried archaeological assets and key components of the historic landscape arising from construction activities within the permanent footprint of the Proposed Development, including within the working width of the pipeline, access routes and haul roads, and from the establishment of the carbon capture sites, above ground installations and construction compound(s).
- 10.6.3 The construction of the Proposed Development has the potential to result in significant effects to non-designated heritage assets within the Scoping Boundary. This includes potential permanent impacts to buried archaeological remains.
- 10.6.4 The construction of the Proposed Development may result in temporary changes to the settings of designated and non-designated heritage assets located within the Scoping Boundary.
- 10.6.5 Due to the potential for significant effects on heritage assets arising from the construction of the Proposed Development, the impacts on archaeology and heritage assets will be scoped into the EIA.

Operational Phase

- 10.6.6 Operational activities at above ground components of the Proposed Development, the final locations of which are to be determined, have the potential to result in changes to the settings of

heritage assets. As such, impacts arising from the operational Proposed Development will be assessed in the EIA.

Decommissioning

- 10.6.7 Decommissioning of the Proposed Development could entail removal of capture facilities and above ground components of the Proposed Development; underground pipeline infrastructure would be left in situ once operation ceases.
- 10.6.8 The establishment of access and working areas for decommission and the presence of dismantling activities has the potential to result in additional temporary impacts through change in the setting of designated and non-designated assets. There is also the potential for physical impacts to occur during decommissioning on archaeological remains protected in place at the construction phase. As such, impacts arising from the decommissioning phase of the Proposed Development will be scoped into the EIA.

Mitigation

- 10.6.9 Embedded Mitigation will be built into the Proposed Development to minimise impacts to heritage assets and their setting, as far as possible, with particular consideration given to the listed buildings and known archaeological sites located within the Scoping Boundary. Avoidance, micro-siting and route refinement will be embedded into the design of the Proposed Development where possible. This strategy ensures that, when and where available, baseline data collection will input directly into the iterative design process so that designated heritage assets, non-designated heritage assets, potential sub-surface archaeological remains (particularly suspected features of likely medium or high heritage importance or concentrated areas of known complex archaeological features) and above ground heritage assets are avoided, wherever possible, within the confines of engineering and other environmental constraints. Any embedded mitigation identified will be set out within the relevant environmental management plans, which will be submitted with the application and secured as a DCO requirement.
- 10.6.10 Mitigation options will be developed and refined during the impact assessment process and discussed with stakeholders including Historic England and the historic environment advisors and conservation officers for the relevant local planning authorities. The development of mitigation will follow guidance published by ClfA and may include detailed design to avoid or reduce impacts to heritage assets, or a programme of archaeological investigation and recording in advance of, or during, construction.
- 10.6.11 Where the Proposed Development will bring about direct impacts to heritage assets, these effects will be mitigated through additional mitigation measures such as detailed landscape/topographic survey, archaeological investigation and recording, historic building recording, and archaeological monitoring/watching brief. Further details will be provided within the ES. Any additional mitigation identified (not including embedded mitigation) will be set out within an archaeological mitigation strategy which will be agreed with stakeholders and submitted with the application, to be secured as a DCO requirement.
- 10.6.12 Possible mitigation measures in relation to specific phases of the Proposed Development are presented below:
- Construction
 - Protection in place of below ground archaeological remains;
 - Archaeological investigation and recording prior to the construction phase;

- Screening from vegetation planting; and
- Utilisation of topographic characteristics to screen the Proposed Development from the local landscape.
- Operation
 - Utilisation of motion activated task lighting to minimise intrusion during operational activities; and
 - Application of restricted working hours to minimise intrusion during operational activities;
- Decommissioning
 - Appropriate measures to ensure no impact on below ground archaeological remains protected in place.

10.7 Scope and Methodology

10.7.1 This section outlines the scope and methodology that will be employed for assessing the likely significant effects associated with the historic environment in the EIA.

Scope

10.7.2 A historic environment Desk-Based Assessment (DBA) will be prepared in conformance with industry standards and best practice guidelines, namely the Chartered Institute for Archaeologists Standard and Guidance for Historic Environment Desk-Based Assessment (2020) (Ref 10-20), and Historic England's Good Practice Advice in Planning Notes 2 (Ref 10-17), 3 (Ref 10-18) and 12 (Ref 10-19). The DBA will take note of any responses received as part of the scoping phase and consultation on the Proposed Development. The DBA will inform and form an appendix to the PEIR and ES historic environment chapters.

10.7.3 Desk-based research will use the following data sources:

- Derbyshire Historic Environment Record (HER);
- Staffordshire HER;
- Cheshire HER, held by Chester and Cheshire West Council;
- Merseyside HER;
- The NHLE held by Historic England, for spatial and non-spatial data on designated heritage assets;
- Relevant local authority conservation area appraisal and management documents;
- Historic Landscape Characterisation (HLC) mapping undertaken by local planning authorities;
- National Record of the Historic Environment (NRHE) held by Historic England; and
- Aerial photographs held by Historic England, local authorities and other appropriate repositories and other readily available remote sensing results such as Lidar data.

10.7.4 The DBA will be supported by a heritage walkover survey to view relevant designated and non-designated assets and identify potential additional assets not recorded in existing datasets. The DBA will collate baseline information on designated and non-designated heritage assets and historic landscape character and identify assets to be scoped in for assessment in the ES.

- 10.7.5 The potential effects of the Proposed Development upon heritage assets will be considered in the context of relevant legislation, planning policy and guidance, including:
- Ancient Monuments and Archaeological Areas Act 1979 (Ref 10-1);
 - Planning (Listed buildings and Conservation Areas) Act 1990 (Ref 10-2);
 - National Planning Policy Framework 2025 (Ref 10-7);
 - Relevant local planning policy;
 - Planning Practice Guidance (Ref 10-8); and
 - Guidance published by Historic England and the Chartered Institute for Archaeologists, including the Code of Conduct (Ref 10-21 and Ref 10-22).
- 10.7.6 The methodology for assessing the impacts of the Proposed Development will broadly follow the criteria set out in Chapter 4: EIA Approach and Methodology of this Scoping Report. Further details are provided below.

Receptor Sensitivity/Value

- 10.7.7 Relevant historic environment receptors – referred to as heritage assets in line with the terminology applied in the NPPF (NPPF Annex 2, Glossary) will be identified based on the baseline data gathering exercise undertaken from both secondary and primary sources.
- 10.7.8 The value of a heritage asset (its heritage significance) is guided by its designated status but is derived also from its heritage interest which may be archaeological, architectural, artistic or historic (NPPF Annex 2, Glossary). Using professional judgement and the results of consultation, heritage assets are also assessed on an individual basis, and regional variations and individual qualities are taken into account where applicable.
- 10.7.9 Each heritage asset relevant to the assessment will be assigned a value in accordance with the criteria in Table 10-6. For the purposes of this assessment value and sensitivity are largely equivalent. This table provides guidance, but professional judgment will be applied in all cases regarding the appropriate category for individual heritage assets. Where it is assessed that an asset is of greater or lower value than noted in the guidance table, justification will be provided.

Table 10-6: Criteria for Determining the Value of Heritage Assets

Value	Criteria
High	World Heritage Sites. Scheduled Monuments. Grade I and II* listed buildings. Registered battlefields. Grade I and II* registered parks and gardens. Conservation areas of demonstrable high value. Non-designated heritage assets (archaeological sites, historic buildings, monuments, parks, gardens or landscapes) that can be shown to have demonstrable national or international importance.
Medium	Grade II listed buildings. Conservation areas. Grade II registered parks and gardens.

Value	Criteria
	Non-designated heritage assets (archaeological sites, historic buildings, monuments, park, gardens or landscapes) that can be shown to have demonstrable regional importance. Averagely preserved historic landscape character areas, exhibiting reasonable coherence, time-depth or other critical factor(s). Historic townscape with historic integrity in that the assets that constitute their make-up are clearly legible.
Low	Locally listed buildings. Non-designated heritage assets (archaeological sites, historic buildings, monuments, park, gardens or landscapes) that can be shown to have demonstrable local importance. Assets whose values are compromised by poor preservation or survival of contextual associations to justify inclusion into a higher grade. Historic landscape character areas whose value is limited by poor preservation and/ or poor survival of contextual associations.
Very Low	Assets identified on national or regional databases, but which have no archaeological, architectural, artistic or historic value. Landscapes with no or little significant historical merit.

Magnitude of impact

10.7.10 Having identified the value of the heritage asset, the next stage in the assessment is to identify the level and degree of impact to an asset arising from the development. Impacts may arise during construction or operation and can be temporary or permanent. Impacts can occur to the physical fabric of the asset or may arise from changes within its setting.

Table 10-7: Criteria for Determining the Magnitude of Impact

Value	Criteria
High	Changes such that the heritage value of the asset is totally altered or destroyed. Comprehensive change to elements of setting that would result in harm to the asset and our ability to understand and appreciate its heritage significance.
Medium	Change such that the heritage value of the asset is significantly altered or modified. Changes such that the setting of the asset is noticeably different, affecting significance and resulting in changes in our ability to understand and appreciate the heritage value of the asset.
Low	Changes such that the heritage value of the asset is slightly affected. Changes to the setting that have a slight impact on significance resulting in changes in our ability to understand and appreciate the heritage value of the asset.
Very Low	Changes to the asset that hardly affect heritage value.

Value	Criteria
	Changes to the setting of an asset that have little effect on significance and no real change in our ability to understand and appreciate the heritage value of the asset.

Significance criteria

- 10.7.11 The significance of environmental effect is typically a function of the value (Table 10-6) of a receptor and the magnitude (Table 10-7) of an impact. An indicative matrix for the determination of significance is provided in Table 4-5 in Chapter 4: EIA Approach and Methodology. Effects can be neutral, adverse or beneficial.

Consultation

- 10.7.12 In addition to formal consultation, engagement with Historic England and relevant Archaeological Advisors for Local Planning Authorities will be undertaken to confirm the scope of the historic environment Desk-based Assessment and heritage surveys. Further consultation and engagement will be undertaken with stakeholders following the completion of the historic environment DBA and at key stages of survey work, especially for example related to the geophysical survey.

Assumptions and limitations

- 10.7.13 This chapter includes a high-level review of available data and presents an overview of the historic environment baseline, focused on designated heritage assets. Given the scale of the Proposed Development, this chapter is only intended to identify potential pathways to significant effects for the purpose of defining a scope for the historic environment assessment as part of the ES. It does not present all known or previously unrecorded heritage receptors which will be presented in subsequent assessments.
- 10.7.14 As previously stated, non-designated heritage assets have not been presented in this chapter. Information for these assets will be requested from the relevant Historic Environment Records (HER) and incorporated into the assessment presented within the DBA, PEIR and ES.
- 10.7.15 Data supporting this report was obtained from third party sources and may include errors or omissions. All efforts were made to identify and rectify any such issues.
- 10.7.16 As noted above, data held by the NHLE for Conservation Areas is incomplete as this data is provided by Local Authorities (LAs). In some cases, this data has not yet been digitised and is only available as the original leaflets released for local use and now published in pdf form on council websites. Provision will be made to digitise this information for inclusion in the baseline assessment within the PEIR and ES.

Summary of issues to be scoped in / out

- 10.7.17 Taking into account the historic environment baseline information collated for this Scoping Report, the following Study Areas will be taken forward for assessment in the EIA:
- 500 m from the draft Order Limits (once established) in relation to the below ground components of the Proposed Development;
 - 2 km from the draft Order Limits in relation to above ground components of the Proposed Development; and

10.7.18 Wider up to 5 km from the draft Order Limits (once established) in relation to above ground components of the Proposed Development for heritage assets of particular sensitivity to change.

10.7.19 Table 10-8 and Table 10-9 below outline a summary of historic environment issues to be scoped in or out at the assessment phase. Table 10-8 refers to issues scoped in/out in relation to above ground components of the Proposed Development and Table 10-9 refers to issues scoped in/out in relation to below ground components of the Proposed Development.

Table 10-8: Historic Environmental Scope – Above Ground Components

Historic Environmental Scope – Above Ground Components (i.e. Capture Facilities, AGIs and BVSSs)				
Scope Scoped in ✓, scoped out ✗	Construction (C), Operation (O), Decommissioning (D)			Rationale
	C	O	D	
Temporary impacts through change to the setting of designated heritage assets	✓	✗	✓	Temporary impacts through change to setting are likely to occur during construction and decommissioning phases due to the presence of construction/dismantling activity.
Temporary impacts through change to the setting of non-designated heritage assets	✓	✗	✓	Temporary impacts through change to setting are likely to occur during construction and decommissioning phases due to the presence of construction/dismantling activity.
Permanent impacts through change to the setting of designated assets	✓	✓	✗	Permanent impacts through change to setting are possible during the construction and operation of the Proposed Development.
Permanent impacts through change to the setting of non-designated heritage assets	✓	✓	✗	Permanent impacts through change to setting are possible during the construction and operation of the Proposed Development.
Physical impacts to known below ground archaeological remains	✓	✗	✓	Physical impacts are likely to occur during the construction of the Proposed Development. There is also the potential for physical impacts to occur during decommissioning on archaeological remains protected in place at the construction phase.

Historic Environmental Scope – Above Ground Components (i.e. Capture Facilities, AGIs and BVSs)				
Physical impacts to as yet unknown below ground archaeological remains	✓	✗	✗	Physical impacts are likely to occur during the construction of the Proposed Development.
Temporary impacts on historic landscape character	✓	✗	✓	Temporary impacts to historic landscape character are likely to occur during the construction phase due to the establishment of construction access and working areas.
Permanent impacts on historic landscape character	✓	✓	✗	Permanent impacts are possible during the construction and operation of the Proposed Development.

Table 10-9: Historic Environment Scope – Below Ground Components

Historic Environmental Scope – Below Ground Components (i.e. Peak Cluster Pipeline and Coastal AGI to MLWS Pipeline(s))				
Scope Scoped in ✓, scoped out ✗	Construction (C), Operation (O), Decommissioning (D)			Rationale
	C	O	D	
Temporary impacts through changes to the setting of designated heritage assets	✓	✗	✓	Temporary impacts due to change in setting are likely to occur during construction and decommissioning phases due to the presence of construction and dismantling activity.
Temporary impacts through changes to the setting of non-designated heritage assets	✓	✗	✓	Temporary impacts due to change in setting are likely to occur during construction and decommissioning phases due to the presence of construction and dismantling activity.
Permanent impacts through changes to the setting of	✓	✓	✗	Permanent impacts due to change in setting are possible during construction and operation of the Proposed Development, to be assessed at the desk-based assessment stage.

Historic Environmental Scope – Below Ground Components (i.e. Peak Cluster Pipeline and Coastal AGI to MLWS Pipeline(s))				
designated heritage assets				
Permanent impacts through changes to the setting of non-designated heritage assets	✓	✓	✗	Permanent impacts due to change in setting are possible during construction and operation of the Proposed Development, to be assessed at the desk-based assessment stage.
Physical impacts to known below ground archaeological remains	✓	✗	✓	Physical impacts are likely to occur during the construction of the Proposed Development. There is also the potential for physical impacts to occur during decommissioning on archaeological remains protected in place at the construction phase.
Physical impacts to as yet unknown below ground archaeological remains	✓	✗	✗	Physical impacts are likely to occur during the construction of the Proposed Development.
Temporary impacts on historic landscape character	✓	✗	✗	Temporary impacts on historic landscape character are likely to occur during the construction phase due to the establishment of construction access and working areas.
Permanent impacts on historic landscape character	✓	✓	✗	Permanent impacts on historic landscape character are possible during construction and operation of the Proposed Development, to be assessed at the desk-based assessment stage.

10.8 Summary

- 10.8.1 Section 10.5 of this chapter has identified a large number of designated heritage assets as part of the historic environment baseline of the initial Study Area for the Proposed Development. Designated heritage assets are deemed to be sensitive receptors in line with their designation, with the most sensitive receptors comprising nationally important assets including world heritage sites and their buffer zones, scheduled monuments, grade I and II* listed buildings and registered parks and gardens. Conservation areas are also considered to be sensitive receptors, specially where these include a concentration of grade I or II* listed buildings and / or scheduled monuments.

- 10.8.2 The proposed scope of the assessment is outlined in Section 10.7. A historic environment DBA will be undertaken, with a number of data sources proposed to be consulted in combination with walkover surveys to establish the historic environment baseline for the Proposed Development. An assessment of the archaeological potential within the Order Limits will be undertaken and the heritage significance of those heritage assets identified. Heritage assets that would be potentially impacted by the Proposed Development will be identified and the DBA will recommend which heritage assets should be taken forward for further assessment at PEIR and ES stage.
- 10.8.3 Key considerations at assessment phase include identification of the significance of designated and non-designated heritage assets that may be affected by the Proposed Development and the contribution of their setting to that significance; and the identification of known and the potential for previously unknown below ground archaeological remains. Study Areas of 500 m for the below ground components of the Proposed Development, 2 km for above ground components of the Proposed Development and up to 5 km for above ground components of the Proposed Development for assets of particular sensitivity to change will be applied for the assessment phase; the Study Areas will be reviewed following consultation with statutory consultees, and after examination of Zone of Theoretical Visibility (ZTV) figures produced in later design stages.

10.9 References

- Ref 10-1** HM Government (1979). Ancient Monuments and Archaeological Areas Act (1979) (as amended). Available at: www.legislation.gov.uk/ukpga/1979/46; as amended by National Heritage Act 1983 (available at: <https://www.legislation.gov.uk/ukpga/1983/47>) and National Heritage Act 2002 (available at: <https://www.legislation.gov.uk/ukpga/2002/14>).
- Ref 10-2** HM Government (1990). Planning (Listed Buildings and Conservation Areas) Act (1990). Available at: <https://www.legislation.gov.uk/ukpga/1990/9/contents>.
- Ref 10-3** HM Government (1997). The Hedgerows Regulations (1997). Available at: <https://www.legislation.gov.uk/uksi/1997/1160/contents/made>.
- Ref 10-4** HM Government (2010). The Infrastructure Planning (Decisions) Regulations 2010. Available at: <https://www.legislation.gov.uk/ukdsi/2010/9780111490266/contents>.
- Ref 10-5** Department for Energy Security & Net Zero (2025) Overarching National Policy Statement for Energy (EN-1). Available at: <https://assets.publishing.service.gov.uk/media/68093d68148a9969d2394f59/draft-nps-en-1.pdf>
- Ref 10-6** National Planning Policy Framework. Available at: <https://www.gov.uk/government/publications/national-planning-policy-framework--2#full-publication-update-history>.
- Ref 10-7** Planning Practice Guidance: Historic Environment. <https://www.gov.uk/government/collections/planning-practice-guidance>
- Ref 10-8** Peak District National Park (2011) Local Development Framework
- Ref 10-9** Wirral Council (2025). Wirral Local Plan 2022 – 2040. Adopted 31 March 2025. Available at: <https://www.wirral.gov.uk/sites/default/files/2025-07/Wirral%20Local%20Plan%202022-2040%20Written%20Statement.pdf>

- Ref 10-10** Cheshire West and Chester Council (2015). Local Plan Part One – Strategic Policies. Adopted January 2015. Available at: <https://www.cheshirewestandchester.gov.uk/asset-library/lp1-2025-review-approved.pdf>
- Ref 10-11** Cheshire West and Chester Council (2019). Local Plan Part Two – Land Allocations and Detailed Policies. Adopted 2019. Available at: <https://consult.cheshirewestandchester.gov.uk/kse/event/34617>
- Ref 10-12** Cheshire East Council (2017). Cheshire Est Local Plan. Adopted July 2017. Available at: <https://www.cheshireeast.gov.uk/planning/spatial-planning/cheshire-east-local-plan/cheshire-east-local-plan.aspx>
- Ref 10-13** High Peak Borough Council (2016). High Peak Local Plan. Adopted April 2016. Available at: <https://www.highpeak.gov.uk/media/160/The-High-Peak-Local-Plan-Adopted-April-2016/pdf/cjThe-High-Peak-Local-Plan-Adopted-April-2016.pdf?m=1514473710280>
- Ref 10-14** Derbyshire Dales District Council (2017). Adopted Derbyshire Dales Local Plan. Available at: <https://dev2.derbyshiredales.gov.uk/planning/planning-policy-and-local-plan/local-plan/local-plan-information-and-adoption>
- Ref 10-15** Staffordshire Moorlands District Council (2020). Staffordshire Moorlands Local Plan. Adopted September 2020. Available at: <https://www.staffs Moorlands.gov.uk/media/6155/Adopted-Local-Plan/pdf/c0Adopted-Local-Plan.pdf?m=1601645140880>
- Ref 10-16** DLUHC and MHCLG (2024). Planning Practice Guidance (PPG). Available at: <https://www.gov.uk/government/collections/planning-practice-guidance>
- Ref 10-17** Historic England (2015). Historic Environment Good Practice Advice in Planning: 2, Managing Significance in Decision Taking in the Historic Environment. Available at: <http://historicengland.org.uk/images-books/publications/gpa2-managing-significance-in-decision-taking/>
- Ref 10-18** Historic England (2017). Historic Environment Good Practice Advice in Planning Note: 3, The Setting of Heritage Assets. Available at: <https://historicengland.org.uk/images-books/publications/gpa3-setting-of-heritage-assets/heag180-gpa3-setting-heritage-assets/>
- Ref 10-19** Historic England (2019). Historic England Advice Note 12, Statements of Heritage Significance: Analysing Significance in Heritage Assets. Available at: <https://historicengland.org.uk/images-books/publications/statements-heritage-significance-advice-note-12/heag279-statements-heritage-significance/>
- Ref 10-20** ClfA (2020a). Standard and guidance for historic environment desk-based assessment. Chartered Institute for Archaeologists, Reading. Available at <https://www.archaeologists.net/sites/default/files/2023-11/ClfA-SandG-DBA-2020.pdf#:~:text=This%20guidance%20seeks%20to%20define%20good%20practice%20for,key%20section%20of%20this%20document%20is%20the%20Standard>
- Ref 10-21** ClfA (2022). Code of Conduct: professional ethics in archaeology. Chartered Institute for Archaeologists, Reading. Available at: <https://www.archaeologists.net/sites/default/files/Code%20of%20conduct%20revOct2022.pdf>

Ref 10-22 Institute of Environmental Management and Assessment (IEMA), the Institute of Historic Building Conservation (IHBC) and Chartered Institute for Archaeologists (CIfA) (2021). Principles of Cultural Heritage Impact Assessment in the UK. Available at:
https://www.archaeologists.net/sites/default/files/j30361_iema_principlesofchia_v8.pdf

11. Water Environment and Flood Risk

11.1 Introduction

- 11.1.1 This chapter presents an initial baseline for the water environment and flood risk, an overview of the methodology to be followed for the EIA and identifies the potential effects of the Proposed Development and how these might be mitigated.
- 11.1.2 After defining the Study Area, this chapter identifies key water features² and provides an initial review of the baseline hydrology, surface water and groundwater quality, hydromorphology, water resources, areas of flood risk, and any relevant designations. The surveys and methodology proposed to assess potential impacts on the water environment are presented, including the requirements and proposed approach to the Flood Risk Assessment (FRA) and a Water Framework Directive (WFD) compliance assessment. This chapter concludes by setting out the receptors and matters to be assessed in further detail by the EIA and ultimately presented in the ES.

11.2 Legislation, Policy and Guidance

- 11.2.1 A brief overview of the legislative, policy and guidance relevant to the water environment and FRA have been reviewed and summarised in Table 11-1, Table 11-2 and Table 11-3.

Table 11-1: Relevant Legislation for Water Environment

Legislation
Environment Act 2021 (Ref 11-2)
Water Act 2014 (Ref 11-3)
Flood and Water Management Act 2010 (Ref 11-4)
Marine and Coastal Access Act 2009 (Ref 11-15)
Environment Act 1995 (Ref 11-5)
Land Drainage Act 1991 (Ref 11-6)
Water Resources Act 1991 (Ref 11-7)
Environmental Protection Act 1990 (Ref 11-8)
Salmon and Freshwater Fisheries Act 1975 (Ref 11-9)
Control of Pollution Act 1974 (Ref 11-10)
Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (Ref 11-11)
Environmental Permitting (England and Wales) Regulations 2016 (Ref 11-12)
Environmental Damage (Prevention and Remediation) Regulations 2015 (Ref 11-13)
Flood Risk Regulations 2009 (Ref 11-14).
Eels (England and Wales) Regulations 2009 (Ref 11-15).
Control of Substances Hazardous to Health Regulations 2002 (Ref 11-17)

² Water features are defined as any watercourse (e.g. river, stream, drain ditch etc. through which water may flow other than a sewer), canal, lakes, reservoirs, estuaries, coastal waters and groundwater. For this assessment ponds are considered primarily as an ecological habitat and are considered in Chapter 6 Biodiversity.

Legislation

Control of Pollution (Oil Storage) (England) Regulations 2001 (Ref 11-18)

Table 11-2: Relevant National Planning Policy

National and Regional Strategic and Planning Policy
National Planning Policy Statements (NPS) (Ref 11-27)
National Policy Statement for Water Resources Infrastructure (Ref 11-28)
National Planning Policy Framework (NPPF) and associated Planning Practice Guidance (Ref 11-29)
Wirral Local Plan 2022 to 2040 (Ref 11-30)
Cheshire West and Chester Council Local Plan (Ref 11-31)
Cheshire East Local Plan (Ref 11-32)
Staffordshire Moorlands Council Local Plan (Ref 11-33)
High Peak Borough Council Local Plan (Ref 11-34)
Derbyshire Dales Council Local Plan (Ref 11-35)
Humber River Basin Management Plan (2022) (Ref 11-36)
North West River Basin Management Plan (2022) (https://www.gov.uk/guidance/humber-river-basin-district-river-management-plan-updated-2022 Ref 11-37)
Dee River Basin Management Plan (2022) (Ref 11-38)
The UK Government's 25 Year Environment Plan (2018) (Ref 11-39)
The UK Government's Environmental Improvement Plan (2023) (Ref 11-40)
The UK Government's Future Water Strategy (2011) (Ref 11-41)
National standards for sustainable drainage systems (SuDS) (Ref 11-42)
The Building Regulations 2010 Approved Document H Drainage and Waste Disposal (Ref 11-43)

Table 11-3: Relevant Guidance

Guidance
Planning Policy Guidance: Flood Risk and Coastal Change (Ref 11-51)
National Planning Policy Framework: Meeting the challenge of climate change, flooding and coastal change (Ref 11-52)
Nationally Significant Infrastructure Projects: Advice on the Water Framework Directive (Ref 11-53)
Local flood risk management guidelines published by the Lead Local Flood Authorities (Ref 11-54)
Construction Industry Research and Information Association (CIRIA) C753 The SuDS Manual (Ref 11-55)
National Highway Design Manual for Roads and Bridges (DMRB) (Ref 11-56)

Guidance

National SuDS Standards (Ref 11-57)

11.3 Defining the Study Area

11.3.1 For the purposes of this scoping assessment the Study Area is the zone within which key receptors are identified that may be impacted from the construction, operation and decommissioning of the Proposed Development. The extent of the Study Area has been informed by a review of the maximum parameters of the Proposed Development, desk-based research, the routing and siting work undertaken to date, knowledge of the area and professional judgement. The Study Area is outlined in the following sections but will be reviewed at each stage of assessment to ensure a proportionate approach.

Defining the Study and Survey Area

- 11.3.2 The Study Area for water environment and flood risk is the land within the Scoping Boundary and a 500 m buffer each side of the corridor. This Study Area will allow all surface water features that may be impacted to be identified.
- 11.3.3 For groundwater, the Study Area is a buffer zone of 1 km extending from the Scoping Boundary. This is considered an appropriate Study Area for the assessment of hydrogeological effects as significant effects would not be expected to propagate further than this. Where evidence suggests that hydrogeological effects may extend beyond the 1 km buffer, these areas and receptors will also be considered within the assessment.
- 11.3.4 In terms of flood risk, the Study Area takes into consideration the crossing of Main Rivers and Ordinary Watercourses including the crossing of associated floodplains which may be physically impacted.
- 11.3.5 However, it is also possible, without suitable mitigation, for water quality impacts to propagate downstream, and flood risk impacts to potentially occur upstream and downstream. In terms of water quality impacts, the distance within which impacts may occur is variable and depends on many factors (e.g. conveyance potential, flow conditions, size and mobility of the polluting substance/matter etc.). As the water environment baseline is developed further at subsequent stages of assessment, consideration of any other downstream water feature attributes will also be made to ensure that the most appropriate importance grade for each watercourse is determined. Typically, a precautionary distance of around a few km is used after which it is generally considered that dilution and dispersion of chemical pollutants would negate the risk of significant adverse effects. However, this will be kept under constant review as more information about the Proposed Development becomes available.

11.4 Baseline Environment

- 11.4.1 An initial study of the baseline environment has been undertaken through desk-based research and is presented in Table 11-4 to Table 11-10.
- 11.4.2 The baseline provides a description of the key features of the water environment within the Study Area, indicating their current status and condition, against which the potential change arising from the development of the Proposed Development will be assessed.
- 11.4.3 Key Sources of information for the hydrology and flood risk assessment include:

- EA Catchment Data Explorer website (Ref 11-1);
- EA Flood Map for Planning website (Ref 11-20);
- EA Long Term Flood Risk Map for Planning website (Ref 11-21);
- Multi-agency geographical information for the countryside (MAGIC) website (Ref 11-22);
- Natural England Designated Sites website (Ref 11-24); and
- British Geological Survey (BGS) GeoIndex (Ref 11-23).

11.4.4 Further desk study of available background data will be undertaken at subsequent stages of the assessment (e.g. available online water quality and aquatic ecology survey data). Data on licensed water abstractions and Public Water Supplies (PWS) will be requested from the EA and Local Planning Authority at the PEIR stage. Data on pollution incidents in the past 5 years recorded on the National Incident Recording System, permitted discharges and any other relevant information will be requested from the EA. Depending on the results, there may be the need for further data collection (e.g. ecological surveys and data gathering from owner/occupiers of any PWS identified as potentially at risk).

Table 11-4: Water Environment and Flood Risk Baseline Environment – Breedon Capture Facility

Water Environment and Flood Risk Baseline environment – Breedon Capture Facility	
Baseline	
Surface Water The Breedon capture facility falls within the boundary of three water body catchments: Noe from Peakshole Water to Derwent (Bradwell Brook), Peakshole Water Catchment (tributary of Noe), and Noe from Source to Peakshole Water, and Monk's Dale Catchment (tributary of Wye). With the exception of Monk's Dale, all of these waterbodies are located within the Study Area. The water body catchments cross the Derwent Upper - Derbyshire Operational Catchment, in the Derwent Derbyshire Management Catchment, in the Humber River Basin District. There are no nearby canals, transitional or coastal water bodies. Ponds have been considered as discrete habitat types under 'Biodiversity'. The Ladybower Reservoir (GB30432459), which is important for public water supply, is the only large waterbody within the Study Area and is located to the north of the site. There are also no chalk streams located within Study Area. The Study Area is located within the Peak District National Park and within close proximity to several protected ecological sites that may be associated with water features or be themselves dependent on specific water quality and hydrological conditions (referred to as Protected Areas under the Water Environment (WFD) (England and Wales) Regulations 2017). There are a number of SSSIs located within the Study Area, including: Castleton, Dirlow Rake and Pindale, Oxlow Rake, South Lee Meadows, and Bradwell Dale and Bagshaw Cavern. There may also be Local Wildlife Sites and these will be considered at subsequent stages of assessment. The site falls within 500m500 m of the Peak District Dales SAC Nutrient Neutrality Catchment. At this stage of the Project, information on licenced surface water abstractions or any unlicensed, local PWS is not yet available. These will be identified and assessed at a later stage of the assessment. The Study Area is located within 500 m of the Noe from Source to Peakshole Water DrWPA, and the Study Area is also partly located within the Upper River Derwent (SWSGZ2305) Drinking Water Safeguard Zone. The Study Area is not located within an NVZ.	

Water Environment and Flood Risk Baseline environment – Breedon Capture Facility

Flood Risk

Based on a review of the Study Area for the Hope Cement capture facility, and aerial and OS maps. EA Main Rivers (Bradwell Brook and River Noe) are located within the Study Area, which has associated Flood Zones. There are also unnamed Ordinary Watercourses located within the Study Area.

The Study Area is located inland and lies outside the tidal floodplain, meaning it is not at risk from tidal flooding. There are areas at risk of surface water flooding across the Study Area.

The Study Area is underlain by a Principal, Secondary A and Secondary B aquifer in the bedrock and a Secondary and Secondary (undifferentiated) aquifer in the superficial deposits. The presence of a Principal Aquifer, which is associated with high groundwater vulnerability, suggests that review of any existing ground investigations should be undertaken to assess the potential for groundwater flooding or otherwise new investigations may be required.

The Study Area is not at risk of flooding from canals. The Study Area is shown to be at risk of flooding from Ladybower Reservoir, in the unlikely event of a reservoir breach.

Existing risk of sewer flood risk could not be quantified at this stage of assessment due to the absence of available data. However, the Study Area is located within the existing quarry boundary, therefore drainage systems are likely to be in place and will be considered at subsequent stages of assessment.

Hydrogeology

The Study Area contains superficial deposits of till, head, and alluvium. The bedrock geology includes a variety of formations: Millstone Grit Group, Mam Tor Beds, and Bowland Shale Formation (comprising mudstone, siltstone, and sandstone), Bee Low Limestone Formation and its apron-reef variant, Litton Tuff Member (tuff), and Monsal Dale Limestone Formation. The Castleton SSSI GWDTE, borders and extends to the west of the site. The Study Area is situated within the WFD Derwent-Carboniferous Limestone (GB40401G103100) and the Derwent- Secondary Combined (GB40402G990400) groundwater bodies. There are no SPZ or Drinking Water Safeguard Zones (Groundwater).

Sensitive Receptors

Surface Water/ Hydromorphology

There are three WFD water bodies within the Study Area, which will all have a range of importance based on their attributes (likely from low to high or very high importance). Each of the three watercourses within the Study Area will need to be assessed to understand the level of impact from all phases of the development.

There are also several Protected Areas within a few km of the Study Area. These Protected Areas will be considered as part of the water environment impact assessment where they are part of or online with water features that may be impacted. However, any surface water dependent terrestrial ecosystem sites and habitats that are independent of watercourses will be assessed under 'Biodiversity'.

The Peak District Dales SAC is a Nutrient Neutrality Catchment and development must not increase the release of nutrients into sensitive receptors.

At this stage of the project, information on licenced surface water abstractions or any unlicensed, local PWS is not yet available. These will be identified and assessed at a later stage of the assessment. The Study Area is located near the Noe from Source to Peakshole Water DrWPA and partly located within the Upper River Derwent (SWSGZ2305) Drinking Water Safeguard Zone.

The morphology of potentially impacted watercourses will be described following walkover surveys and more detailed desk study at subsequent stages of assessment. This will include an appraisal of the sensitivity of each watercourse to physical impacts, which will in part inform the development of appropriate watercourse crossing methods to be defined in a future Watercourse Crossing Register.

Water Environment and Flood Risk Baseline environment – Breedon Capture Facility

Flood Risk

- Fluvial flood risk: The Study Area is partially located in Flood Zone 2 and 3 associated with Bradwell Brook and the River Noe, two EA Main Rivers. A small Ordinary Watercourse, a tributary of Bradwell Brook, is also located within the Study Area. The Main River and Ordinary Watercourse will need to be assessed to understand the level of impact from the development. Any works in or nearby a Main River or Ordinary Watercourse may require a Flood Risk Activity Permit (FRAP) or Ordinary Watercourse Land Drainage Consent (OWLDC).
- Tidal Flood Risk: The Study Area is not at risk from tidal flooding.
- Surface water flood risk: Surface water extents are predicted across the Study Area, with areas classified as being at high (0.1 – 1% AEP), medium (1% - 3.3% AEP) and low (0.1% - 1% AEP) risk of surface water flooding. These extents will require further assessment to determine the potential impact of the development.
- Groundwater flood risk: The Study Area is underlain by aquifers, as detailed above, which suggests that review of any existing ground investigations should be undertaken to assess the potential for groundwater flooding or otherwise new investigations may be required.
- Reservoir flood risk: The Study Area is located within the predicted flood extent (dry and wet day) of the Ladybower Reservoir in the unlikely event of a reservoir breach. However, reservoirs present a managed risk and therefore the risk from reservoir flooding is considered residual.
- Sewer flood risk: Existing risk of sewer flood risk could not be quantified at this stage of assessment due to the absence of available data. However, the Study Area is located within the existing quarry boundary, therefore drainage systems are likely to be in place and will be considered at subsequent stages of assessment.

Hydrogeology

Hydrogeological receptors identified:

- WFD Derwent-Carboniferous Limestone and the Derwent- Secondary Combined groundwater bodies and aquifers including:
 - Superficial aquifers: Secondary A Aquifer, Secondary Undifferentiated Aquifer.
 - Bedrock aquifers: Principal Aquifer, Secondary A Aquifer, Secondary B Aquifer.
- Groundwater abstractions: No information is available at present with relation to licensed and private groundwater abstractions.
- GWDTE: Castleton SSSI.

Future Baseline

The future baseline would be determined qualitatively by considering the possibility of changes in the attributes that are considered when deciding the importance of water features in the Study Area. However, in terms of the surface water environment, the receptor importance criteria are largely based on the presence or not of various attributes. Thus, no significant changes to baseline conditions are predicted for the future baseline, as the principal reasons for differences in water body importance are unlikely to change. For this reason, the assessment will be undertaken against existing baseline conditions.

Future baseline groundwater conditions are likely to show greater stress on aquifer systems from rising abstraction demands, with climate-related changes such as reduced recharge and sea-level rise further lowering aquifer storage and increasing the risk of saline intrusion, especially in coastal areas. However, groundwater conditions are unlikely to change significantly during construction and operation.

Water Environment and Flood Risk Baseline environment – Breedon Capture Facility

In assessing the future baseline of flood risk, climate change scenarios can be used to determine the future fluvial and surface water flood extents. In this Study Area, changing rainfall patterns are likely to increase peak river flows, thereby resulting in higher levels of fluvial flood risk from Main Rivers and Ordinary Watercourses. Increased storm intensity, frequency and duration are likely to exacerbate existing surface water flooding and enhance the connectivity and persistence of overland flow pathways. Therefore, surface water flood risk within the Study Area is expected to increase. The risk of flooding from reservoirs is not likely to be as impacted by climate change given that the water levels in reservoirs are maintained to a pre-determined level and so the volume contained in the reservoir will remain the same in the future.

Table 11-5: Water Environment and Flood Risk Baseline Environment – Tarmac Capture Facility

Water Environment and Flood Risk Baseline environment – Tarmac Capture Facility

Baseline

Surface Water

The Tarmac capture facility falls within the Wye from Source to Monk's Dale water body catchment, in the Derwent Upper - Derbyshire Operational Catchment. The operational catchment falls within the Derwent Derbyshire Management Catchment, in the Humber River Basin District. The Study Area is located approximately 300 m upstream of The Wye from Source to Monk's Dale water body. There are no canals, lakes, transitional or coastal water bodies within the Study Area. Ponds have been considered as discrete habitat types under 'Chapter 6 Biodiversity'. There are no chalk streams located within Study Area.

The capture facility is located on the edge of the Peak District National Park and within close proximity to several protected ecological sites that may be associated with water features or be themselves dependent on specific water quality and hydrological conditions (referred to as Protected Areas under the Water Environment (WFD) (England and Wales) Regulations 2017). Waterswallows Quarry, and The Wye Valley SSSI's are all within the Study Area, as is the Peak District Dales SAC. There may also be Local Wildlife Sites and these will be considered at subsequent stages of assessment. The site also falls within the Peak District Dales SAC Nutrient Neutrality Catchment.

At this stage of the Project, information on licenced surface water abstractions or any unlicensed, local PWS is not yet available. These will be identified and assessed at a later stage of the assessment. The Study Area is not located within a Drinking Water Protected Area (DrWPA) but is located within the Upper River Derwent (SWSGZ2305) Drinking Water Safeguard Zone. The Study Area is also not located within a Nitrate Vulnerable Zone (NVZ).

Flood Risk

There are no Main Rivers, Ordinary Watercourses or land drainage ditches within the Study Area, though The Wye from Source to Monk's Dale water body lies approximately 300 m downstream.

The Study Area is located inland and lies outside the tidal floodplain, meaning it is not at risk from tidal flooding.

There are areas at risk of surface water flooding across the Study Area.

The Study Area is underlain by a Principal, Secondary A and Secondary B aquifer in the bedrock and a Secondary A aquifer in the superficial deposits. The presence of a Principal Aquifer, which is associated with high groundwater vulnerability, suggests that a review of any existing ground investigations should be undertaken to assess the potential for groundwater flooding or otherwise new investigations may be required.

Water Environment and Flood Risk Baseline environment – Tarmac Capture Facility

The Study Area is not at risk of flooding from canals or lakes and is not located within a predicted reservoir flood extent.

Existing risk of sewer flood risk could not be quantified at this stage of assessment due to the absence of available data. However, the Study Area is located within the existing quarry boundary, therefore drainage systems are likely to be in place and will be considered at subsequent stages of assessment.

Hydrogeology

The BGS Geoindex identifies Alluvium along the eastern boundary of the site, with no other superficial deposits within the Study Area of the site. The underlying geology in this area consists mainly of Bee Low Limestone Formation, Lower Miller's Dale Lava Member, and unnamed Dinantian-age microgabbro intrusions. Additionally, the Groundwater Dependent Terrestrial Ecosystem (GWDTE) known as 'Wye Valley' lies within the site and Study Area, extending southward along the River Wye and its tributaries. Two areas of Source Protection Zone 1 (SPZ1) are located within the Study Area, one to the east along the site boundary and a second to the south-west at the edge of the Study Area. The Study Area is situated within the WFD Derwent-Carboniferous Limestone groundwater body (GB40401G103100).

Sensitive Receptors

Surface Water/Hydromorphology

There are no WFD waterbodies within the Study Area though The Wye from Source to Monk's Dale water body lies approximately 300 m downstream. Consideration of downstream water feature attributes will be made to ensure that the most appropriate importance grade for each watercourse is determined. The water body importance will be based on its attributes (likely from low to high or very high importance) and will need to be assessed to understand the level of impact from all phases of the development.

There are also several Protected Areas within a few km of the Study Area. These Protected Areas will be considered as part of the water environment impact assessment where they are hydrologically connected to or potentially influenced by water features within the study area. However, any surface water dependent terrestrial ecosystem sites and habitats that are independent of watercourses will be assessed under 'Biodiversity'.

The Peak District Dales SAC is a Nutrient Neutrality Catchment, and development must not increase the release of nutrients.

At this stage of the Project, information on licenced surface water abstractions or any unlicensed, local PWS is not yet available. These will be identified and assessed at a later stage of the assessment.

The Study Area is within the Upper River Derwent (WSGZ2305) Drinking Water Safeguard Zone.

The morphology of potentially impacted watercourses will be described following walkover surveys and more detailed desk study at subsequent stages of assessment. This will include an appraisal of the sensitivity of each watercourse to physical impacts, which will in part inform the development of appropriate watercourse crossing methods to be defined in a future Watercourse Crossing Register.

Flood Risk

- Fluvial flood risk: The Study Area is located in Flood Zone 1, indicating a low annual exceedance probability (AEP) of fluvial flooding and there are no Main River or Ordinary Watercourses within the Study Area.
- Tidal Flood Risk: The Study Area is not at risk from tidal flooding.
- Surface water flood risk: Surface water flood extents are predicted across the Study Area, with areas classified as being at high (0.1 – 1% AEP), medium (1% - 3.3% AEP) and low (0.1% - 1% AEP) risk of surface water flooding. These extents will require further assessment to determine the potential impact of the development.

Water Environment and Flood Risk Baseline environment – Tarmac Capture Facility

- Groundwater flood risk: The Study Area is underlain by aquifers, as detailed above, which suggests that review of any existing ground investigations should be undertaken to assess the potential for groundwater flooding or otherwise new investigations may be required.
- Reservoir flood risk: The Study Area is not located within a reservoir predicted flood extent (dry or wet day).
- Sewer flood risk: Existing risk of sewer flood risk could not be quantified at this stage of assessment due to the absence of available data. However, the Study Area is located within the existing quarry boundary, therefore drainage systems are likely to be in place and will be considered at subsequent stages of assessment.

Hydrogeology

Hydrogeological receptors identified include:

- Two areas of SPZ1.
- WFD Derwent-Carboniferous Limestone groundwater body and aquifers including:
 - Superficial aquifers: Secondary A Aquifer.
 - Bedrock aquifers: Principal Aquifer, Secondary A Aquifer, Secondary B Aquifer.
- Groundwater abstractions: No information is available at present with relation to licensed and private groundwater abstractions but they could be present.
- River Wye GWDTE.

Future Baseline

The future baseline would be determined qualitatively by considering the possibility of changes in the attributes that are considered when deciding the importance of water features in the Study Area. However, in terms of the surface water environment, the receptor importance criteria are largely based on the presence or not of various attributes. Thus, no significant changes to baseline conditions are predicted for the future baseline, as the principal reasons for differences in water body importance are unlikely to change. For this reason, the assessment will be undertaken against existing baseline conditions. Future baseline groundwater conditions are likely to show greater stress on aquifer systems from rising abstraction demands, with climate-related changes such as reduced recharge and sea-level rise further lowering aquifer storage and increasing the risk of saline intrusion, especially in coastal areas. However, groundwater conditions are also unlikely to change significantly during construction and operation.

In assessing the future baseline of flood risk, climate change scenarios can be used to determine the future fluvial and surface water flood extents. In this Study Area, increased storm intensity, frequency and duration are likely to exacerbate existing surface water flooding and enhance the connectivity and persistence of overland flow pathways. Therefore, surface water flood risk within the Study Area is expected to increase.

Table 11-6: Water Environment and Flood Risk Baseline Environment – Buxton Lime Capture Facility

Water Environment and Flood Risk Baseline environment – Buxton Lime Capture Facility
Baseline
Surface Water The Buxton Lime capture facility operates from and within the Tarmac Tunstead Site and therefore lies within the proposed Tarmac Capture Facility Study Area. The capture facility falls within the Wye from Source to Monk's Dale water body catchment, in the Derwent Upper - Derbyshire Operational Catchment. The operational catchment falls within the Derwent Derbyshire Management Catchment, in the Humber River Basin District. The Study Area is located approximately 300m upstream of The Wye from Source to Monk's Dale water body. There are no nearby canals, lakes, transitional or coastal water bodies within the Study Area. Ponds have been considered as discrete habitat types under 'Ecology'. There are no chalk streams located within the Study Area. The Study Area is located on the edge of the Peak District National Park and within close proximity to several protected ecological sites that may be associated with water features or be themselves dependent on specific water quality and hydrological conditions (referred to as Protected Areas under the Water Environment (WFD) (England and Wales) Regulations 2017). Waterswallows Quarry, and The Wye Valley SSSI's are all within the Study Area, as is the Peak District Dales SAC. There may also be Local Wildlife Sites and these will be considered at subsequent stages of assessment. The site falls within the Peak District Dales SAC Nutrient Neutrality Catchment. At this stage of the project, information on licenced surface water abstractions or any unlicensed, local Private Water Supplies (PWS) is not yet available. These will be identified and assessed at a later stage of the assessment. The Study Area is not located within a DrWPA however it is located within the Upper River Derwent (SWSGZ2305) Drinking Water Safeguard Zone. The Study Area is also not located within a NVZ. Flood Risk Based on a review of the Buxton Lime Capture Facility, referred to as the Study Area, and online OS and aerial maps there are no Main Rivers, Ordinary Watercourses or land drainage ditches within the Study Area, though The Wye from Source to Monk's Dale water body lies approximately 300 m downstream. The Study Area is located inland and lies outside the tidal floodplain, meaning it is not at risk from tidal flooding. There are areas at risk of surface water flooding across the Study Area. The Study Area is underlain by a Principal, Secondary A and Secondary B aquifer in the bedrock and a Secondary A aquifer in the superficial deposits. The presence of a Principal Aquifer, which is associated with high groundwater vulnerability, suggests that review of any existing ground investigations should be undertaken to assess the potential for groundwater flooding or otherwise new investigations may be required. The Study Area is not at risk of flooding from canals or lakes and is not located within a predicted reservoir flood extent. Existing risk of sewer flood risk could not be quantified at this stage of assessment due to the absence of available data. However, the Study Area is located within the existing quarry boundary, therefore drainage systems are likely to be in place and will be considered at subsequent stages of assessment. Hydrogeology The BGS identifies Alluvium along the eastern boundary watercourse of the Proposed Development, with no other superficial deposits within 1km of the Study Area. The underlying geology in this area consists mainly of Bee Low Limestone Formation, Lower Miller's Dale Lava Member, and unnamed Dinantian-age

Water Environment and Flood Risk Baseline environment – Buxton Lime Capture Facility

microgabbro intrusions. One area of SPZ1 is located to the east of the facility within the Study Area. The Study Area is situated within the WFD Derwent-Carboniferous Limestone groundwater body (GB40401G103100).

Sensitive Receptors

Surface Water/Hydromorphology

There are no WFD waterbodies within the Study Area though The Wye from Source to Monk's Dale water body lies approximately 300 m downstream. Consideration of downstream water features may be required where there is an indirect pathway, which will be considered as part of the impact assessment. The water features importance will be based on its attributes (likely from low to high or very high importance) and will need to be assessed to understand the level of impact from all phases of the development.

There are also several Protected Areas within a few km of the Study Area. These Protected Areas will be considered as part of the water environment impact assessment where they are part of or online with water features that may be impacted. However, any surface water dependent terrestrial ecosystem sites and habitats that are independent of watercourses will be assessed under 'Biodiversity'.

The Peak District Dales SAC is a Nutrient Neutrality Catchment and development must not increase the release of nutrients.

At this stage of the project, information on licenced surface water abstractions or any unlicensed, local Private Water Supplies (PWS) is not yet available. These will be identified and assessed at a later stage of the assessment.

The Study Area is not located within a DrWPA however it is located within the Upper River Derwent (SWSGZ2305) Drinking Water Safeguard Zone.

The morphology of potentially impacted watercourses will be described following walkover surveys and more detailed desk study at subsequent stages of assessment. This will include an appraisal of the sensitivity of each watercourse to physical impacts, which will in part inform the development of appropriate watercourse crossing methods to be defined in a future Watercourse Crossing Register.

Flood Risk

- Fluvial flood risk: The Study Area is located in Flood Zone 1, indicating a low annual exceedance probability (AEP) of fluvial flooding and there are no Main River or Ordinary Watercourses within the Study Area.
- Tidal Flood Risk: The Study Area is not at risk from tidal flooding.
- Surface water flood risk: Surface water flood extents are predicted across the Study Area, with areas classified as being at high (0.1 – 1% AEP), medium (1% - 3.3% AEP) and low (0.1% - 1% AEP) risk of surface water flooding. These extents will require further assessment to determine the potential impact of the development.
- Groundwater flood risk: The Study Area is underlain by aquifers, as detailed above, which suggests that review of any existing ground investigations should be undertaken to assess the potential for groundwater flooding or otherwise new investigations may be required.
- Reservoir flood risk: The Study Area is not located within a reservoir predicted flood extent (dry or wet day).
- Sewer flood risk: Existing risk of sewer flood risk could not be quantified at this stage of assessment due to the absence of available data. However, the Study Area is located within the existing quarry

Water Environment and Flood Risk Baseline environment – Buxton Lime Capture Facility

boundary, therefore drainage systems are likely to be in place and will be considered at subsequent stages of assessment.

Hydrogeology

Hydrogeological receptors identified:

- One area of SPZ1.
- Aquifers include:
 - Superficial aquifers: Secondary A Aquifer.
 - Bedrock aquifers: Principal Aquifer, Secondary A Aquifer, Secondary B Aquifer.
- Groundwater abstractions: No information is available at present with relation to licensed and private groundwater abstractions.
- WFD Derwent-Carboniferous Limestone groundwater body.

Future Baseline

The future baseline would be determined qualitatively by considering the possibility of changes in the attributes that are considered when deciding the importance of water features in the Study Area. However, in terms of the surface water environment, the receptor importance criteria are largely based on the presence or not of various attributes. Thus, no significant changes to baseline conditions are predicted for the future baseline, as the principal reasons for differences in water body importance are unlikely to change. For this reason, the assessment will be undertaken against existing baseline conditions. Future baseline groundwater conditions are likely to show greater stress on aquifer systems from rising abstraction demands, with climate-related changes such as reduced recharge and sea-level rise further lowering aquifer storage and increasing the risk of saline intrusion, especially in coastal areas. However, groundwater conditions are unlikely to change significantly during construction and operation. In assessing the future baseline of flood risk, climate change scenarios can be used to determine the future fluvial and surface water flood extents. In this Study Area, increased storm intensity, frequency and duration are likely to exacerbate existing surface water flooding and enhance the connectivity and persistence of overland flow pathways. Therefore, surface water flood risk within the Study Area is expected to increase.

Table 11-7: Water Environment and Flood Risk Baseline Environment – Holcim Capture Facility

Water Environment and Flood Risk Baseline environment – Holcim Capture Facility

Baseline

Surface Water

The Holcim capture facility lies within the Hamps from Source to R Manifold water body catchment, which flows through the Study Area. The water body catchment is located in the Dove Upper Rivers and Lakes Operational Catchment, in the Dove Management Catchment, in the Humber River Basin District. There are no nearby canals, lakes, transitional or coastal water bodies. Ponds have been considered as discrete habitat types under 'Biodiversity'. There are no chalk streams located within Study Area.

The Study Area is located to the south of the Peak District National Park, to the east of Stoke on Trent, and within close proximity to several protected ecological sites that may be associated with water features or be themselves dependent on specific water quality and hydrological conditions (referred to as Protected Areas under the Water Environment (WFD) (England and Wales) Regulations 2017). Several SSSI's are all within the Study Area including: Caldon Dales, Caldon Low, Cauldon Railway Cutting, Brownend Quarry, and Hamps and Manifold Valleys. There may also be Local Wildlife Sites and these will

Water Environment and Flood Risk Baseline environment – Holcim Capture Facility

be considered at subsequent stages of assessment. The site does not fall within a Nutrient Neutrality Catchment.

At this stage of the Project, information on licenced surface water abstractions or any unlicensed, local PWS is not yet available. These will be identified and assessed at a later stage of the assessment. The Study Area for this Site is also not located within a DrWPA, a Drinking Water Safeguard Zone, nor an NVZ.

Flood Risk

Based on a review of the Holcim capture facility, referred to as the Study Area, and online OS and aerial maps there is a Main River (River Hamps) located within the Study Area, which has an associated floodplain. There are no Ordinary Watercourses or land drainage ditches within the Study Area.

The Study Area is located inland and lies outside the tidal floodplain, meaning it is not at risk from tidal flooding.

There are areas at risk of surface water flooding across the Study Area.

The Study Area is underlain by a Principal and Secondary A aquifer in the bedrock and a Secondary (undifferentiated) aquifer in the superficial deposits. The presence of a Principal Aquifer, which is associated with high groundwater vulnerability, suggests that review of any existing ground investigations should be undertaken to assess the potential for groundwater flooding or otherwise new investigations may be required.

The Study Area is not at risk of flooding from canals or lakes and is not located within a predicted reservoir flood extent.

Existing risk of sewer flood risk could not be quantified at this stage of assessment due to the absence of available data. However, the Study Area is located within the existing quarry boundary, therefore drainage systems are likely to be in place and will be considered at subsequent stages of assessment.

Hydrogeology

The Study Area includes superficial deposits of till, head, and alluvium. Bedrock geology comprises a range of formations: Milldale and Hopedale Limestone Formations (limestone), Widmerpool Formation (interbedded limestone and mudstone), Bowland Shale and Morridge Formations (mudstone, siltstone, and sandstone), and Hurdlow Sandstones (sandstone). Environmentally, the Caldon Dales SSSI GWDTE roughly borders the south-east of the site boundary, while the Hamps and Manifold Valleys SSSI GWDTE is located approximately 890m to the north-east. The Study Area is situated within the WFD Dove-Carboniferous Limestone (GB40401G301900) and the Dove – Millstone Grit/Coal Measures groundwater bodies (GB40402G303000). There are no SPZ or Drinking Water Safeguard Zones (Groundwater)

Sensitive Receptors

Surface Water/Hydromorphology

The River Hamps lies within the Study Area, which will have an importance rating based on its attributes (likely from low to high or very high importance). The watercourse will need to be assessed to understand the level of impact from all phases of the development.

There are also several Protected Areas within a few km of the Study Area. These Protected Areas will be considered as part of the water environment impact assessment where they are part of or online with water features that may be impacted. However, any surface water dependent terrestrial ecosystem sites and habitats that are independent of watercourses will be assessed under 'Biodiversity'.

At this stage of the project, information on licenced surface water abstractions or any unlicensed, local Private Water Supplies (PWS) is not yet available. These will be identified and assessed at a later stage of the assessment. The Study Area is not located within a DrWPA, a Drinking Water Safeguard Zone, nor an NVZ.

Water Environment and Flood Risk Baseline environment – Holcim Capture Facility

The morphology of potentially impacted watercourses will be described following walkover surveys and more detailed desk study at subsequent stages of assessment. This will include an appraisal of the sensitivity of each watercourse to physical impacts, which will in part inform the development of appropriate watercourse crossing methods to be defined in a future Watercourse Crossing Register.

Flood Risk

- Fluvial flood risk: The Study Area is partially located within Flood Zone 2 and 3, associated with the River Hamps (Main River).
- Tidal Flood Risk: The Study Area is not at risk from tidal flooding.
- Surface water flood risk: Surface water extents are predicted across the site, with areas classified as being at high (0.1 – 1% AEP), medium (1% - 3.3% AEP) and low (0.1% - 1% AEP) risk of surface water flooding. These extents will require further assessment to determine the potential impact of the development.
- Groundwater flood risk: The Study Area is underlain by aquifers, as detailed above, which suggests that review of any existing ground investigations should be undertaken to assess the potential for groundwater flooding or otherwise new investigations may be required.
- Reservoir flood risk: The site is not located within a reservoir predicted flood extent (dry or wet day).
- Sewer flood risk: Existing risk of sewer flood risk could not be quantified at this stage of assessment due to the absence of available data. However, the Study Area is located within the existing quarry boundary, therefore drainage systems are likely to be in place and will be considered at subsequent stages of assessment.

Hydrogeology

Hydrogeological receptors identified include:

- WFD Dove- Carboniferous Limestone and the Dove – Millstone Grit/Coal Measures groundwater bodies and aquifers including:
 - Superficial aquifers: Secondary Undifferentiated Aquifer.
 - Bedrock aquifers: Principal Aquifer, Secondary A Aquifer.
- Groundwater abstractions: No information is available at present with relation to licensed and private groundwater abstractions.
- GWDTE: Caldon Dales SSSI and Hamps and Manifold Valleys SSSI.

Future Baseline

The future baseline would be determined qualitatively by considering the possibility of changes in the attributes that are considered when deciding the importance of water features in the Study Area. However, in terms of the surface water environment, the receptor importance criteria are largely based on the presence or not of various attributes. Thus, no significant changes to baseline conditions are predicted for the future baseline, as the principal reasons for differences in water body importance are unlikely to change. For this reason, the assessment will be undertaken against existing baseline conditions.

Future baseline groundwater conditions are likely to show greater stress on aquifer systems from rising abstraction demands, with climate-related changes such as reduced recharge and sea-level rise further lowering aquifer storage and increasing the risk of saline intrusion, especially in coastal areas. However, groundwater conditions are unlikely to change significantly during construction and operation.

Water Environment and Flood Risk Baseline environment – Holcim Capture Facility

In assessing the future baseline of flood risk, climate change scenarios can be used to determine the future fluvial and surface water flood extents. In this Study Area, changing rainfall patterns are likely to increase peak river flows, thereby resulting in higher levels of fluvial flood risk from Main Rivers and Ordinary Watercourses. Increased storm intensity, frequency and duration are likely to exacerbate existing surface water flooding and enhance the connectivity and persistence of overland flow pathways. Therefore, surface water flood risk within the Study Area is expected to increase.

Table 11-8: Water Environment and Flood Risk Baseline Environment – Peak Cluster Pipeline (East)

Water Environment and Flood Risk Baseline environment – Peak Cluster Pipeline (East)

Baseline

Surface Water

The Pipeline (East) traverses several water body catchments across seven Operational Catchments, four different Management Catchments, in two separate River Basin Districts (RBD). The following Operational catchments have been identified, and their respective Management Catchments and RBD's:

Operational Catchment	Management Catchment	River Basin District
Derwent Upper – Derbyshire	Derwent Derbyshire	Humber
Churnet Rivers and Lakes	Dove	Humber
Dove Upper Rivers and Lakes	Dove	Humber
Bollin Dean Mersey Upper	Mersey Upper	North West
Goyt Etherow Tame	Mersey Upper	North West
Dane	Weaver Gowy	North West
Weaver Lower	Weaver Gowy	North West

The pipeline will cross the Peak Forest Canal (upper section) and Macclesfield Canal (upper section) and the Macclesfield Canal (lower section), which are both Canal and River Trust assets. There are several reservoirs within the Pipeline (East) Study Area including: Rudyard Reservoir, Horse Coppice Reservoir and Bollinhurst Reservoir. There are no nearby transitional or coastal water bodies. Ponds have been considered as discrete habitat types under 'Biodiversity'. There are no chalk streams located within the Study Area.

The Pipeline (East) Study Area crosses many protected ecological sites that may be associated with water features or be themselves dependent on specific water quality and hydrological conditions (referred to as Protected Areas under the Water Environment (WFD) (England and Wales) Regulations 2017). This includes a number of SSSI's and SAC's. This includes the Peak District Dales SAC which is a Nutrient Neutrality Catchment. There may also be Local Wildlife Sites and these will be considered at subsequent stages of assessment.

At this stage of the project, information on licenced surface water abstractions or any unlicensed, local PWS is not yet available. These will be identified and assessed at a later stage of the assessment. Four DrWPA's fall within the Study Area: River Dane (Clough Brook to Cow Brook), Bollinhurst Reservoir, Horse Coppice Reservoir and Noe from Source to Peakshole Water. The Study Area is also partly located within the Upper River Derwent (SWSGZ2305), Wybersley (SWSGZ3202) and Tittesworth Res & River Churnet (SWSGZ2202) Drinking Water Safeguard Zones, The Study Area is located within the River Weaver (Dane to Frodsham) NVZ.

Flood Risk

Water Environment and Flood Risk Baseline environment – Peak Cluster Pipeline (East)

There are several Main Rivers across Pipeline (East), which have associated flood extents (listed under 'sensitive receptors'). There are also numerous Ordinary Watercourses and ditches.

The Pipeline (East) is located inland and lies outside the tidal floodplain, meaning it is not at risk from tidal flooding.

There are areas at risk of surface water flooding across Pipeline (East).

The Pipeline (East) is underlain by a Principal, Secondary A and Secondary B aquifer in the bedrock and a Secondary A and Secondary (undifferentiated) aquifer in the superficial deposits. The presence of a Principal Aquifer, which is associated with high groundwater vulnerability, suggests that further ground investigations should be undertaken to assess the potential for groundwater flooding.

The pipeline crosses canals and is located within the flood extent of reservoirs, as referred to above, in the unlikely event of a reservoir breach.

Existing risk of sewer flood risk could not be quantified in this stage of assessment due to the absence of available data. Given the highly rural nature of the pipeline, the presence of formal sewer infrastructure such as sewers and manholes is considered unlikely however due to the length of the pipeline this may increase the likelihood of encountered formal sewer infrastructure. Therefore, sewer flood risk should be further assessed at a later stage.

Hydrogeology

The Study Area is largely covered by till, with smaller patches of glaciofluvial deposits and alluvium along watercourses, increasing in extent toward the west. The bedrock geology includes undifferentiated Dinantian limestone with subordinate sandstone and argillaceous rocks, the Millstone Grit Group (mudstone, siltstone, sandstone), and undifferentiated Pennine and South Wales Lower Coal Measures Formations (mudstone, siltstone, sandstone, coal and ironstone). Triassic mudstone, siltstone, and sandstone dominate, with Permian sandstone and conglomerate present in the western part of the area. Multiple Source Protection Zones (SPZ1, SPZ2, and SPZ3) are present, along with several GWDTEs. There is one area of Drinking Water Safeguard Zone (groundwater) within the Study Area. The Study Area crosses eight WFD groundwater bodies:

- Derwent-Secondary Combined.
- Derwent- Carboniferous Limestone.
- Dove- Carboniferous Limestone.
- Manchester and East Cheshire Carboniferous Aquifers.
- Manchester and East Cheshire Permo-Triassic Sandstone Aquifers.
- Weaver and Dane Quaternary Sand and Gravel Aquifers.
- Dove- PT Sandstone Leek.
- Dove- Millstone Grit/Coal Measures.

Sensitive Receptors

Surface Water/ Hydromorphology

There are numerous watercourses within the Study Area, which will all have a range of importance based on their attributes (likely from low to high or very high importance). Each watercourse within the Study Area will need to be assessed to understand the level of impact from all phases of the development.

There are also several Protected Areas within a few km of the Study Area. These Protected Areas will be considered as part of the water environment impact assessment where they are part of or online with water features that may be impacted. However, any surface water dependent terrestrial ecosystem sites and habitats that are independent of watercourses will be assessed under 'Biodiversity'.

Water Environment and Flood Risk Baseline environment – Peak Cluster Pipeline (East)

The Peak District Dales SAC is a Nutrient Neutrality Catchment and development must not increase the release of nutrients.

At this stage of the project, information on licenced surface water abstractions or any unlicensed, local PWS is not yet available. These will be identified and assessed at a later stage of the assessment. Four DrWPA fall within the Study Area: River Dane (Clough Brook to Cow Brook), Bollinhurst Reservoir, Horse Coppice Reservoir and Noe from Source to Peakshole Water. The Study Area is also partly located within the Upper River Derwent (SWSGZ2305) Wybersley (SWSGZ3202) and Tittesworth Res & River Churnet (SWSGZ2202) Drinking Water Safeguard Zones. The Study Area is located within the River Weaver (Dane to Frodsham) NVZ, although it is unlikely that the Proposed Development will impact this designation.

The morphology of potentially impacted watercourses will be described following walkover surveys and more detailed desk study at subsequent stages of assessment. This will include an appraisal of the sensitivity of each watercourse to physical impacts, which will in part inform the development of appropriate watercourse crossing methods to be defined in a future Watercourse Crossing Register.

Flood Risk

- Fluvial flood risk: The Pipeline (East) is partially located in Flood Zone 2 and 3 associated with various Main Rivers and watercourses including Warm Brook, River Goyt, Todd Brook, Bollinhurst Brook, Poynton Brook, River Dean. Various small Ordinary Watercourses also traverse Pipeline (East) including on Chapel-en-le-Frith Golf Course, south of Bollinhurst Brook and crossing the B5358.
- Tidal Flood Risk: The Pipeline (East) is not at risk from tidal flooding.
- Surface water flood risk: Surface water extents are predicted across the Pipeline (East), with areas classified as being at high (0.1 – 1% AEP), medium (1% - 3.3% AEP) and low (0.1% - 1% AEP) risk of surface water flooding. These extents will require further assessment to determine the potential impact of the development.
- Groundwater flood risk: The Pipeline (East) is underlain by aquifers, as detailed above, further ground investigations should be undertaken to assess the potential for groundwater flooding and the potential impact of the development.
- Canal flood risk: Peak Forest Canal and Macclesfield Canal flow through the Pipeline (East) Scoping Boundary. Whilst flood risk is not mapped, a review of LiDAR should be undertaken to determine any plausible flow routes in the unlikely event of a breach/overtopping event and will need to be assessed to understand the level of impact from the development.
- Reservoir flood risk: The Pipeline (East) is located within the predicted flood extent (dry and wet day) of a reservoir in the unlikely event of a reservoir breach. However, reservoirs present a managed risk and therefore the risk from reservoir flooding is considered residual in the unlikely event of a reservoir breach.
- Sewer flood risk: Existing risk of sewer flood risk could not be quantified in this stage of assessment due to the absence of available data. Given the highly rural nature of the pipeline, the presence of formal sewer infrastructure such as sewers and manholes is considered unlikely however due to the length of the pipeline this may increase the likelihood of encountered formal sewer infrastructure. Therefore, sewer flood risk should be confirmed through further investigation at a later stage.

Hydrogeology

Hydrogeological receptors identified include:

- SPZ1, SPZ2 and SPZ3.

Water Environment and Flood Risk Baseline environment – Peak Cluster Pipeline (East)

- Eight WFD groundwater bodies (listed above) and aquifers including:
 - Superficial aquifers: Secondary A Aquifer, Secondary Undifferentiated Aquifer.
 - Bedrock aquifers: Principal Aquifer, Secondary A Aquifer, Secondary B Aquifer.
- Groundwater abstractions: No information is available at present with relation to licensed and private groundwater abstractions.
- Several GWDTEs (listed above).
- Drinking Water Safeguard Zone (groundwater).

Future Baseline

The future baseline would be determined qualitatively by considering the possibility of changes in the attributes that are considered when deciding the importance of water features in the Study Area. However, in terms of the surface water environment, the receptor importance criteria are largely based on the presence or not of various attributes. Thus, no significant changes to baseline conditions are predicted for the future baseline, as the principal reasons for differences in water body importance are unlikely to change. For this reason, the assessment will be undertaken against existing baseline conditions. Future baseline groundwater conditions are likely to show greater stress on aquifer systems from rising abstraction demands, with climate-related changes such as reduced recharge and sea-level rise further lowering aquifer storage and increasing the risk of saline intrusion, especially in coastal areas. However, groundwater conditions are unlikely to change significantly during construction and operation. In assessing the future baseline of flood risk, climate change scenarios can be used to determine the future fluvial and surface water flood extents. In this Study Area, changing rainfall patterns are likely to increase peak river flows, thereby resulting in higher levels of fluvial flood risk from Main Rivers and Ordinary Watercourses. Increased storm intensity, frequency and duration are likely to exacerbate existing surface water flooding and enhance the connectivity and persistence of overland flow pathways. Therefore, surface water flood risk within the Study Area is expected to increase. The risk of flooding from reservoirs and canals is not likely to be as impacted by climate change given that the water levels in reservoirs and canals are maintained to a pre-determined level and so the volume contained in the reservoir and canals will remain the same in the future.

Table 11-9: Water Environment and Flood Risk Baseline Environment – Peak Cluster Pipeline (Central)

Water Environment and Flood Risk Baseline environment – Peak Cluster Pipeline (Central)

Baseline

Surface Water

The Pipeline (Central) traverses five Operational Catchments, across two different Management Catchments, in two separate River Basin Districts. The following Operational catchments have been identified:

Operational Catchment	Management Catchment	River Basin District
Dane	Weaver Gowy	North West
Gowy	Weaver Gowy	North West
Weaver Lower	Weaver Gowy	North West
Weaver Upper	Weaver Gowy	North West
Dee Lower Chester Weir to Ceiriog	Dee	Dee

Dane	Weaver Gowy	North West
Gowy	Weaver Gowy	North West

The pipeline will cross the Shropshire Union Canal (Market Drayton to Ellesmere Port) and the Trent and Mersey Canal (summit to Preston Brook Tunnel), which are both Canal and River Trust assets. There are no nearby lakes, transitional or coastal water bodies. Ponds have been considered as discrete habitat types under 'Biodiversity'.

The Study Area crosses several protected ecological sites that may be associated with water features or be themselves dependent on specific water quality and hydrological conditions (referred to as Protected Areas under the Water Environment (WFD) (England and Wales) Regulations 2017). This includes a number of SSSI's, although there are no chalk streams located within the Study Area, and the Study Area does not cross any Nutrient Neutrality Catchments. There may also be Local Wildlife Sites and these will be considered at subsequent stages of assessment.

At this stage of the project, information on licenced surface water abstractions or any unlicensed, local PWS is not yet available. These will be identified and assessed at a later stage of the assessment. The Study Area crosses the Dee - Chester Weir to Ceiriog DrWPA, and Dee (England) (SWSGZ3200) Drinking Water Safeguard Zones. The Study Area is located within nine NVZ: River Weaver (Dane to Frodsham) NVZ, Aldford Brook NVZ, Henlake Brook NVZ, Dee - Chester Weir to Ceiriog NVZ, River Gowy (Milton Brook to Mersey) NVZ, Stanney Mill Brook NVZ and River Gowy, Milton Brook NVZ, Delamere Sandstone, and tribs (Source to Milton Brook) NVZ.

The morphology of potentially impacted watercourses will be described following walkover surveys and more detailed desk study at subsequent stages of assessment. This will include an appraisal of the sensitivity of each watercourse to physical impacts, which will in part inform the development of appropriate watercourse crossing methods to be defined in a future Watercourse Crossing Register.

Flood Risk

There are several Main Rivers across Pipeline (Central), which have associated Flood Zones (listed under 'sensitive receptors'). There are also numerous Ordinary Watercourses and ditches.

The Pipeline (Central) is located inland and lies outside the tidal floodplain, meaning it is not at risk from tidal flooding.

There are areas at risk of surface water flooding across Pipeline (Central).

The Pipeline (Central) is underlain by a Principal, Secondary A and Secondary B aquifer in the bedrock and a Secondary A aquifer in the superficial deposits. The presence of a Principal Aquifer, which is associated with high groundwater vulnerability, suggests that further ground investigations should be undertaken to assess the potential for groundwater flooding.

In addition, the pipeline crosses canals and lies within the mapped flood extent associated with reservoirs, which could present a residual risk in the unlikely event of a reservoir breach.

Existing risk of sewer flood risk could not be quantified in this stage of assessment due to the absence of available data. Given the highly rural nature of the pipeline, the presence of formal sewer infrastructure such as sewers and manholes is considered unlikely however due to the length of the pipeline this may increase the likelihood of encountered formal sewer infrastructure. Therefore, sewer flood risk should be further assessed at a later stage.

Hydrogeology

The Study Area is predominantly covered by till, with smaller zones of glaciofluvial deposits and alluvium along watercourses. The underlying bedrock consists mainly of Triassic mudstone, siltstone, and sandstone, with Permian sandstone and conglomerate present in the western portion. Three SPZ3 areas and one SPZ2 are located along the western part of the route. The pipeline route Study Area includes

Water Environment and Flood Risk Baseline environment – Peak Cluster Pipeline (Central)

several GWDTEs notably Gleads Moss SSSI, Wimboldsley Wood, and the Wettenhall and Darnhall Woods SSSI. The Study Area crosses three WFD groundwater bodies:

- Weaver and Dane Quaternary Sand and Gravel Aquifers.
- Wirral and West Cheshire Permo-Triassic Sandstone Aquifers.
- Dee Permo-Triassic Sandstone.

Sensitive Receptors

Surface Water/ Hydromorphology

There are numerous watercourses within the Study Area, which will all have a range of importance based on their attributes (likely from low to high or very high importance). Each watercourse within the Study Area will need to be assessed to understand the level of impact from all phases of the development.

There are also several Protected Areas within a few km of the Study Area. These Protected Areas will be considered as part of the water environment impact assessment where they are part of or online with water features that may be impacted. However, any surface water dependent terrestrial ecosystem sites and habitats that are independent of watercourses will be assessed under 'Biodiversity'.

At this stage of the project, information on licenced surface water abstractions or any unlicensed, local PWS is not yet available. These will be identified and assessed at a later stage of the assessment. The Study Area crosses the Dee - Chester Weir to Ceiriog DrWPA, and Dee (England) (SWSGZ3200) Drinking Water Safeguard Zones. The Study Area is located within nine NVZ, although it is unlikely that the Proposed Development will impact this designation.

The morphology of potentially impacted watercourses will be described following walkover surveys and more detailed desk study at subsequent stages of assessment. This will include an appraisal of the sensitivity of each watercourse to physical impacts, which will in part inform the development of appropriate watercourse crossing methods to be defined in a future Watercourse Crossing Register.

Flood Risk

- Fluvial flood risk: The Pipeline (Central) is partially located in Flood Zone 2 and 3 associated with various Main Rivers and Ordinary Watercourses including River Bollin, Ben Brook, River Dane, Timbers Brook, Dingle Brook, River Churnet, River Hamps, River Croco, Sandertons Brook, River Wheelock, River Weaver and River Gowy. Various small Ordinary Watercourses also traverse Pipeline Central including west of Prestbury, north of A523, at Marton Lane and Snape Brook.
- Tidal Flood Risk: The Study Area is not at risk from tidal flooding.
- Surface water flood risk: Surface water extents are predicted across the Pipeline (Central), with areas classified as being at high (0.1 – 1% AEP), medium (1% - 3.3% AEP) and low (0.1% - 1% AEP) risk of surface water flooding. These extents will require further assessment to determine the potential impact of the development.
- Groundwater flood risk: The Pipeline (Central) is underlain by aquifers, as detailed above, further ground investigations should be undertaken to assess the potential for groundwater flooding and the potential impact of the development.
- Canal flood risk: Trent and Merseyway Canal and Shropshire Union Canal flow through the Pipeline (Central) Study Area. Whilst flood risk is not mapped, a review of LiDAR should be undertaken to determine any plausible flow routes in the unlikely event of a breach/overtopping event and will need to be assessed to understand the level of impact to and from the development.
- Reservoir flood risk: The Pipeline (Central) is located within the predicted flood extent (dry and wet day) of a reservoir in the unlikely event of a reservoir breach. However, reservoirs present a managed risk and therefore the risk to and from reservoir flooding is considered residual.

Water Environment and Flood Risk Baseline environment – Peak Cluster Pipeline (Central)

- Sewer flood risk: Existing risk of sewer flood risk could not be quantified in this stage of assessment due to the absence of available data. Given the highly rural nature of the pipeline, the presence of formal sewer infrastructure such as sewers and manholes is considered unlikely however due to the length of the pipeline this may increase the likelihood of encountered formal sewer infrastructure. Therefore, sewer flood risk should be confirmed through further investigation at a later stage.

Hydrogeology

Hydrogeological receptors identified:

- SPZ2 and SPZ3.
- Three WFD groundwater bodies and aquifers include:
 - Superficial aquifers: Secondary A Aquifer, Secondary Undifferentiated Aquifer.
 - Bedrock aquifers: Principal Aquifer, Secondary A Aquifer, Secondary B Aquifer.
 - Weaver and Dane Quaternary Sand and Gravel Aquifers.

Ref 11-1 Wirral and West Cheshire Permo-Triassic Sandstone Aquifers.

Ref 11-2 Dee Permo-Triassic Sandstone.

- Groundwater abstractions: No information is available at present with relation to licensed and private groundwater abstractions.
- GWDTE: Glead Moss SSSI, Wimboldsley Wood, and the Wettenhall and Darnhall Woods SSSI.

Future Baseline

The future baseline would be determined qualitatively by considering the possibility of changes in the attributes that are considered when deciding the importance of water features in the Study Area. However, in terms of the surface water environment, the receptor importance criteria are largely based on the presence or not of various attributes. Thus, no significant changes to baseline conditions are predicted for the future baseline, as the principal reasons for differences in water body importance are unlikely to change. For this reason, the assessment will be undertaken against existing baseline conditions. Future baseline groundwater conditions are likely to show greater stress on aquifer systems from rising abstraction demands, with climate-related changes such as reduced recharge and sea-level rise further lowering aquifer storage and increasing the risk of saline intrusion, especially in coastal areas. However, groundwater conditions are unlikely to change significantly during construction and operation. In assessing the future baseline of flood risk, climate change scenarios can be used to determine the future fluvial and surface water flood extents. In this Study Area, changing rainfall patterns are likely to increase peak river flows, thereby resulting in higher levels of fluvial flood risk from Main Rivers and Ordinary Watercourses. Increased storm intensity, frequency and duration are likely to exacerbate existing surface water flooding and enhance the connectivity and persistence of overland flow pathways. Therefore, surface water flood risk within the Study Area is expected to increase. The risk of flooding from reservoirs and canals is not likely to be as impacted by climate change given that the water levels in reservoirs and canals are maintained to a pre-determined level and so the volume contained in the reservoir and canals will remain the same in the future.

Table 11-10: Water Environment and Flood Risk Baseline Environment – Peak Cluster Pipeline (West)

Water Environment and Flood Risk Baseline environment – Peak Cluster Pipeline (West)											
Baseline											
Surface Water The Pipeline (West) traverses two Operational Catchments, across two different Management Catchments, in two separate River Basin Districts. The following Operational catchments have been identified: <table> <tr> <th>Operational Catchment</th><th>Management Catchment</th><th>River Basin District</th></tr> <tr> <td>Wirral</td><td>Mersey Lower</td><td>North West</td></tr> <tr> <td>Dee Estuary</td><td>Dee</td><td>Dee</td></tr> </table> The Pipeline (West) will not cross any canals, however it will be near the Shropshire Union Canal (Market Drayton to Ellesmere Port), which is a Canal and River Trust assets. There are no nearby lakes or transitional water bodies. Ponds have been considered as discrete habitat types under 'Biodiversity'. There are also no chalk streams located within Study Area. The Pipeline (West) Study Area crosses several protected ecological sites that may be associated with water features or be themselves dependent on specific water quality and hydrological conditions (referred to as Protected Areas under the Water Environment (WFD) (England and Wales) Regulations 2017), including SPAs, SSSIs, SACs and Ramsar designated sites. The Study Area does not fall within a Nutrient Neutrality Catchment. There may also be Local Wildlife Sites and these will be considered at subsequent stages of assessment. At this stage of the project, information on licenced surface water abstractions or any unlicensed, local PWS is not yet available. These will be identified and assessed at a later stage of the assessment. The Study Area is not located within a DrWPA or a Drinking Water Safeguard Zones. The Study Area is located within three NVZ: Shotwick Brook NVZ, also includes Clatter Brook NVZ and Neston NVZ.			Operational Catchment	Management Catchment	River Basin District	Wirral	Mersey Lower	North West	Dee Estuary	Dee	Dee
Operational Catchment	Management Catchment	River Basin District									
Wirral	Mersey Lower	North West									
Dee Estuary	Dee	Dee									
Flood Risk There are several Main Rivers across Pipeline (West), which have associated Flood Zones (listed under 'sensitive receptors'). There are also numerous Ordinary Watercourses and ditches. The Study Area is located inland and lies outside the tidal floodplain, meaning it is not at risk from tidal flooding. There are areas at risk of surface water flooding across Pipeline (West). The Study Area is underlain by a Principal and Secondary B aquifer in the bedrock and a Secondary A and Secondary (undifferentiated) aquifer in the superficial deposits. The presence of a Principal Aquifer, which is associated with high groundwater vulnerability, suggests that further ground investigations should be undertaken to assess the potential for groundwater flooding. The Study Area does not cross canals however is located within the flood extent of reservoirs, as referred to above, in the unlikely event of a reservoir breach. Existing risk of sewer flood risk could not be quantified in this stage of assessment due to the absence of available data. Given the highly rural nature of the pipeline, the presence of formal sewer infrastructure such as sewers and manholes is considered unlikely however due to the length of the pipeline this may increase the likelihood of encountered formal sewer infrastructure. Therefore, sewer flood risk should be further assessed at a later stage.											
Hydrogeology The Study Area is primarily covered by till, with smaller regions of glaciofluvial deposits and alluvium associated with watercourses. The bedrock geology is dominated by Triassic mudstone, siltstone, and											

Water Environment and Flood Risk Baseline environment – Peak Cluster Pipeline (West)

sandstone, with limited occurrences of Permian sandstone and conglomerate. Multiple Source Protection Zones (SPZ1, SPZ2, and SPZ3) are present across the area. GWDTEs Thurstaston Common SSSI is present within the Study Area. The Study Area crosses two WFD groundwater bodies:

- Wirral and West Cheshire Permo-Triassic Sandstone Aquifers.
- Dee Permo-Triassic Sandstone.

Sensitive Receptors

Surface Water/ Hydromorphology

There are numerous watercourses within the Study Area, which will all have a range of importance based on their attributes (likely from low to high or very high importance). Each watercourse within the Study Area will need to be assessed to understand the level of impact from all phases of the development.

There are also several Protected Areas within 2 km of the Study Area. These Protected Areas will be considered as part of the water environment impact assessment where they are part of or online with water features that may be impacted. However, any surface water dependent terrestrial ecosystem sites and habitats that are independent of watercourses will be assessed under 'Biodiversity'.

At this stage of the project, information on licenced surface water abstractions or any unlicensed, local Private Water Supplies (PWS) is not yet available. These will be identified and assessed at a later stage of the assessment. The Study Area is not located within a DrWPA or a Drinking Water Safeguard Zones. The Study Area is located within three NVZ: Shotwick Brook NVZ, Clatter Brook NVZ and Neston NVZ.

The morphology of potentially impacted watercourses will be described following walkover surveys and more detailed desk study at subsequent stages of assessment. This will include an appraisal of the sensitivity of each watercourse to physical impacts, which will in part inform the development of appropriate watercourse crossing methods to be defined in a future Watercourse Crossing Register.

Flood Risk

- Fluvial flood risk: The Pipeline (West) is partially located in Flood Zone 2 and 3 associated with various Main Rivers and Ordinary Watercourses including Prenton Brook, Arrowe Brook, Geasby Brook, and two unnamed watercourses close to Raby Road and Brimstage. Various small Ordinary Watercourses also traverse Pipeline Central including west of Prestbury, north of A523, at Marton Lane and Snape Brook. Any works in or nearby a Main River or Ordinary Watercourse may require a Flood Risk Activity Permit (FRAP) or Ordinary Watercourse Land Drainage Consent (OWLDC).
- Tidal Flood Risk: The Study Area is not at risk from tidal flooding.
- Surface water flood risk: Surface water extents are predicted across the Pipeline (West), with areas classified as being at high (0.1 – 1% AEP), medium (1% - 3.3% AEP) and low (0.1% - 1% AEP) risk of surface water flooding. These extents will require further assessment to determine the potential impact of the development.
- Groundwater flood risk: The Pipeline (West) is underlain by aquifers, as detailed above, further ground investigations should be undertaken to assess the potential for groundwater flooding and the potential impact of the development.
- Reservoir flood risk: The site is located within the predicted flood extent (dry and wet day) of the nearest reservoir in the unlikely event of a reservoir breach. However, reservoirs present a managed risk and therefore the risk from reservoir flooding is considered residual.
- Sewer flood risk: Existing risk of sewer flood risk could not be quantified in this stage of assessment due to the absence of available data. Given the highly rural nature of the pipeline, the presence of formal sewer infrastructure such as sewers and manholes is considered unlikely however due to

Water Environment and Flood Risk Baseline environment – Peak Cluster Pipeline (West)

the length of the pipeline this may increase the likelihood of encountered formal sewer infrastructure. Therefore, sewer flood risk should be confirmed through further investigation at a later stage.

Hydrogeology

Hydrogeological receptors include:

- SPZ1, SPZ2 and SPZ3.
- Two WFD groundwater bodies and aquifers including:
 - Superficial aquifers: Secondary A Aquifer, Secondary Undifferentiated Aquifer.
 - Bedrock aquifers: Principal Aquifer, Secondary B Aquifer.
- Groundwater abstractions: No information is available at present with relation to licensed and private groundwater abstractions.
- GWDTE: Thurstaston Common SSSI.

Future Baseline

The future baseline would be determined qualitatively by considering the possibility of changes in the attributes that are considered when deciding the importance of water features in the Study Area. However, in terms of the surface water environment, the receptor importance criteria are largely based on the presence or not of various attributes. Thus, no significant changes to baseline conditions are predicted for the future baseline, as the principal reasons for differences in water body importance are unlikely to change. For this reason, the assessment will be undertaken against existing baseline conditions. Future baseline groundwater conditions are likely to show greater stress on aquifer systems from rising abstraction demands, with climate-related changes such as reduced recharge and sea-level rise further lowering aquifer storage and increasing the risk of saline intrusion, especially in coastal areas. However, groundwater conditions are unlikely to change significantly during construction and operation. In assessing the future baseline of flood risk, climate change scenarios can be used to determine the future fluvial and surface water flood extents. In this Study Area, changing rainfall patterns are likely to increase peak river flows, thereby resulting in higher levels of fluvial flood risk from Main Rivers and Ordinary Watercourses. Increased storm intensity, frequency and duration are likely to exacerbate existing surface water flooding and enhance the connectivity and persistence of overland flow pathways. Therefore, surface water flood risk within the Study Area is expected to increase. The risk of flooding from reservoirs is not likely to be as impacted by climate change given that the water levels in reservoirs are maintained to a pre-determined level and so the volume contained in the reservoir will remain the same in the future.

Table 11-11: Water Environment and Flood Risk Baseline Environment - Coastal AGI to MLWS Pipeline(s)

Water Environment and Flood Risk Baseline environment – Coastal AGI to MLWS Pipeline(s)											
Baseline											
Surface Water The Coastal AGI to MLWS Pipeline(s) traverses two Operational Catchments, across two different Management Catchments, in one River Basin Districts. The following Operational catchments have been identified: <table> <tr> <th>Operational Catchment</th><th>Management Catchment</th><th>River Basin District</th></tr> <tr> <td>North West Region Coastal Waters</td><td>North West TraC</td><td>North West</td></tr> <tr> <td>Wirral</td><td>Mersey Lower</td><td>North West</td></tr> </table> The Coastal AGI to MLWS pipeline will not cross any canals, however it will cross into the Mersey Mouth Coastal Water body, directly into the North Wirral (West) Shellfish Waters and Moreton and Meols Bathing Waters. There are no nearby lakes or transitional water bodies. Ponds have been considered as discrete habitat types under 'Biodiversity'. There are also no chalk streams located within Study Area. The Coastal AGI to MLWS pipeline crosses several protected ecological sites that may be associated with water features or be themselves dependent on specific water quality and hydrological conditions (referred to as Protected Areas under the Water Environment (WFD) (England and Wales) Regulations 2017), including SPA's, SSSI's, SAC's and Ramsar designated sites. The Study Area does not fall within a Nutrient Neutrality Catchment. There may also be Local Wildlife Sites and these will be considered at subsequent stages of assessment. At this stage of the project, information on licenced surface water abstractions or any unlicensed, local PWS is not yet available. These will be identified and assessed at a later stage of the assessment. The Study Area is not located within a DrWPA, Drinking Water Safeguard Zones, or an NVZ.			Operational Catchment	Management Catchment	River Basin District	North West Region Coastal Waters	North West TraC	North West	Wirral	Mersey Lower	North West
Operational Catchment	Management Catchment	River Basin District									
North West Region Coastal Waters	North West TraC	North West									
Wirral	Mersey Lower	North West									
Flood Risk There are several Main Rivers across Pipeline (Coastal AGI to MLWS), which have associated Flood Zones (listed under 'sensitive receptors'). There are also numerous Ordinary Watercourses and ditches. The Study Area is located within the tidal floodplain, meaning it is at risk from tidal flooding from the Irish Sea. The pipeline crosses flood defences located on the Wirral. There are areas at risk of surface water flooding across Pipeline (Coastal AGI to MLWS). The Study Area is underlain by a Principal and Secondary B aquifer in the bedrock and a Secondary A and Secondary (undifferentiated) aquifer in the superficial deposits. The presence of a Principal Aquifer, which is associated with high groundwater vulnerability, suggests that further ground investigations should be undertaken to assess the potential for groundwater flooding. The Study Area does not cross canals and is not located within the flood extent of reservoirs. Existing risk of sewer flood risk could not be quantified in this stage of assessment due to the absence of available data. Given the highly rural nature of the pipeline, the presence of formal sewer infrastructure such as sewers and manholes is considered unlikely however due to the length of the pipeline this may increase the likelihood of encountered formal sewer infrastructure. Therefore, sewer flood risk should be further assessed at a later stage.											
Hydrogeology - The Study Area is primarily covered by till, tidal flat deposits and blow sand superficial deposits and is entirely underlain by Triassic mudstone, siltstone, and sandstone bedrock geology. There is one SPZ3 located within the south of the Study Area. GWDTE Meols											

Water Environment and Flood Risk Baseline environment – Coastal AGI to MLWS Pipeline(s)

Meadows SSSI is crossed by the pipeline near North Wirral (Meols) Waste water Treatment Works (WwTW). The Study Area crosses the Wirral and West Cheshire Permo-Triassic Sandstone Aquifers groundwater body.

Sensitive Receptors

Surface Water/ Hydromorphology

There are numerous watercourses within the Study Area, which will all have a range of importance based on their attributes (likely from low to high or very high importance). Each watercourse within the Study Area will need to be assessed to understand the level of impact from all phases of the development.

There are also several Protected Areas within 2 km of the Study Area. These Protected Areas will be considered as part of the water environment impact assessment where they are part of or online with water features that may be impacted. However, any surface water dependent terrestrial ecosystem sites and habitats that are independent of watercourses will be assessed under 'Biodiversity'.

At this stage of the project, information on licenced surface water abstractions or any unlicensed, local Private Water Supplies (PWS) is not yet available. These will be identified and assessed at a later stage of the assessment. The Study Area is not located within a DrWPA, a Drinking Water Safeguard Zones or a NVZ.

The morphology of potentially impacted watercourses will be described following walkover surveys and more detailed desk study at subsequent stages of assessment. This will include an appraisal of the sensitivity of each watercourse to physical impacts, which will in part inform the development of appropriate watercourse crossing methods to be defined in a future Watercourse Crossing Register.

Flood Risk

- Fluvial flood risk: The Pipeline (Coastal AGI to MLWS) is partially located in Flood Zone 2 and 3 associated with various Main Rivers and Ordinary Watercourses including The Birket, Arrowe Brook, Newton Brook and Carr Drain. Various small Ordinary Watercourses and ditches also traverse the pipeline in the greenspace south of Holylake and Meols. Any works in or nearby a Main River or Ordinary Watercourse may require a Flood Risk Activity Permit (FRAP) or Ordinary Watercourse Land Drainage Consent (OWLDC).
- Tidal Flood Risk: The Study Area is at risk from tidal flooding from the Irish Sea.
- Groundwater flood risk: The Pipeline (Coastal AGI to MLWS) is underlain by aquifers, as detailed above, further ground investigations should be undertaken to assess the potential for groundwater flooding and the potential impact of the development.
- Reservoir flood risk: The site is located within the predicted flood extent (dry and wet day) of the nearest reservoir in the unlikely event of a reservoir breach. However, reservoirs present a managed risk and therefore the risk from reservoir flooding is considered residual.
- Sewer flood risk: Existing risk of sewer flood risk could not be quantified in this stage of assessment due to the absence of available data. Given the highly rural nature of the pipeline, the presence of formal sewer infrastructure such as sewers and manholes is considered unlikely however due to the length of the pipeline this may increase the likelihood of encountered formal sewer infrastructure. Therefore, sewer flood risk should be confirmed through further investigation at a later stage.

Hydrogeology

Hydrogeological receptors include:

- SPZ3.

Water Environment and Flood Risk Baseline environment – Coastal AGI to MLWS Pipeline(s)

- One WFD groundwater body and aquifers including:
 - Superficial aquifers: Secondary A Aquifer, Secondary Undifferentiated Aquifer.
 - Bedrock aquifers: Principal Aquifer, Secondary B Aquifer.
- Groundwater abstractions: No information is available at present with relation to licensed and private groundwater abstractions.
- GWDTE: Meols Meadows SSSI.

Future Baseline

The future baseline would be determined qualitatively by considering the possibility of changes in the attributes that are considered when deciding the importance of water features in the Study Area. However, in terms of the surface water environment, the receptor importance criteria are largely based on the presence or not of various attributes. Thus, no significant changes to baseline conditions are predicted for the future baseline, as the principal reasons for differences in water body importance are unlikely to change. For this reason, the assessment will be undertaken against existing baseline conditions. Future baseline groundwater conditions are likely to show greater stress on aquifer systems from rising abstraction demands, with climate-related changes such as reduced recharge and sea-level rise further lowering aquifer storage and increasing the risk of saline intrusion, especially in coastal areas. However, groundwater conditions are unlikely to change significantly during construction and operation. In assessing the future baseline of flood risk, climate change scenarios can be used to determine the future fluvial and surface water flood extents. In this Study Area, changing rainfall patterns are likely to increase peak river flows, thereby resulting in higher levels of fluvial flood risk from Main Rivers and Ordinary Watercourses. Increased storm intensity, frequency and duration are likely to exacerbate existing surface water flooding and enhance the connectivity and persistence of overland flow pathways. Therefore, surface water flood risk within the Study Area is expected to increase.

11.5 Identification of Potential Effects

11.5.1 Key aspects of the Proposed Development that may affect water environment and flood risk are presented below:

Construction

- Potential chemical pollution of surface and groundwaters;
- Dewatering of excavations potentially lowering groundwater levels, disrupting natural recharge processes and affecting nearby groundwater-dependent receptors;
- Potential impacts on groundwater from the installation of subsurface infrastructure potentially altering the natural groundwater flow regime, redirecting or impeding flow paths;
- Potential impacts on any water abstractions (if confirmed present) in terms of quality and quantity;
- Potential temporary impacts on water levels and sediment dynamics of watercourses;
- Potential impacts to the morphology of watercourses;
- Increased demand for water supply;
- Changes in flood risk from alteration of runoff flow paths and permeability of ground surfaces leading to an increase in runoff volumes and rates into watercourses;

- Changes in flood risk from alteration of sediment dynamics through an excess discharge of sediment and increased flow rates which can alter erosion and deposition patterns;
- Potential loss of flood plain storage and changes to existing fluvial flows during construction works within Flood Zone 2 or 3;
- The existing risk of sewer flood risk could not be quantified in this scoping assessment. This should be confirmed through further investigation at a later stage;
- Reservoirs present a managed risk and therefore the risk from reservoir flooding is considered residual;
- The existing risk of canal breach could not be quantified in this assessment. This should be confirmed through further investigation at a later stage; and
- Due to below ground works, there is potential for groundwater emergence and elevated groundwater flooding.

Operation

- Potential chemical pollution of surface and groundwaters;
- Potential impacts on groundwater from the installation of subsurface infrastructure potentially altering the natural groundwater flow regime, redirecting or impeding flow paths;
- Potential impacts on any water abstractions (if confirmed present) in terms of quality and quantity;
- Potential impacts to the morphology of watercourses;
- Increased demand for water supply;
- Increases to surface water flooding through disruption of flow routes and changes in runoff rates may occur due to AGIs;
- The existing risk of sewer flood risk could not be quantified at this scoping stage. The potential risk will be reviewed at a later stage and if necessary further assessment undertaken;
- The existing risk of canal and/or flood defence breach could not be quantified at this scoping stage. The potential risk will be reviewed at a later stage, and if necessary further assessment undertaken;
- Increases to fluvial flood risk and reducing the capacity of the existing floodplain storage due to the proposed Coastal AGI; and
- During operation, due to some of the works being below ground, there is potential for groundwater emergence and elevated groundwater flooding.

Decommissioning

- Potential chemical pollution of surface and groundwaters;
- Once complete, any impacts associated with water abstractions or discharges from the operation of the Proposed Development would cease to exist;
- Works within Flood Zone 2 or 3 could reduce the capacity of the existing floodplain storage and impact existing fluvial flows;

- During decommissioning, there is the potential to increase impermeable surfaces due to new hardstanding areas and the potential to impede existing surface water flow routes, change runoff rates and create new overland flow paths;
- The existing risk of sewer flood risk could not be quantified in this assessment. This should be confirmed through further investigation at a later stage;
- The existing risk of canal breach could not be quantified in this assessment. This should be confirmed through further investigation at a later stage;
- Reservoirs present a managed risk and therefore the risk from reservoir flooding is considered residual; and
- During decommissioning, there is potential for any below ground works to result in groundwater emergence and elevated groundwater flooding.

11.6 Mitigation

- 11.6.1 Where possible potentially significant adverse impacts will be avoided or managed through embedded design measures. However, where this is not possible, additional mitigation, or potentially compensation measures may be required. These will be determined and developed as part of an iterative design and impact assessment process.
- 11.6.2 Construction and decommissioning phase impacts will be mitigated through the implementation of standard construction techniques and mitigation measures, as are described in a wide range of good practice publications which will be listed in the ES (e.g. Guidance on Pollution Prevention, C811 Environmental good practice on site guide (fifth edition) (CIRIA, 2023) etc.). These will be set out in an Outline CEMP and an Outline Demolition EMP. Additional management plans may be required depending on the key issues that will need to be managed, and may include: a Water Management Plan (WMP), Water Quality Monitoring Plan, Emergency Response Plan, and a Dewatering Strategy etc.
- 11.6.3 For the pipeline installation, the depth below any watercourses would be agreed with statutory stakeholders but will be such as to avoid any risk of exposure of the pipeline (e.g. following river-bed scour). As stated earlier, it is anticipated that only small and less important water features would be crossed by the pipeline using trenched techniques. Prior to the works commencing, a Hydromorphological and Riparian Corridor Survey would be carried out to inform reinstatement of the channel. Where possible, reinstatement will seek to provide enhancement over the current channel form, although the extent of this would be limited to the working area and immediate tie ins. Beyond any pipeline easement the Applicant would not be able to ensure the perpetuity of any enhancements.
- 11.6.4 It is currently anticipated that trenchless crossings would be used for larger and more important watercourses as this would avoid direct impacts to the channel. However, there would need to be management of the risk of ‘frac-out’ events and any dewatering from launch and receiving put excavations either side of the crossing. Trenchless techniques may also be used for crossing beneath other linear or sensitive features (e.g. roads, railways, ancient woodland), and the groundwater pollution risk and any dewatering would need to be carefully managed.
- 11.6.5 Although existing field accesses may be used, it is expected that new temporary access tracks would be needed alongside the pipeline, and that these may require some crossings of watercourses. As temporary works these are likely to be a combination of culverts on smaller

watercourses and clear-span structures on larger watercourses. Measures will be put in place to minimise the potential for adverse impacts. Following completion of the works the temporary crossings will be removed and the watercourses reinstated as found.

- 11.6.6 For the operational development, surface water runoff will need to be managed to ensure the required attenuation and treatment prior to discharge from the site in accordance with the drainage hierarchy. This will be informed by a suitable Drainage Strategy. Any discharges of process water will also need to be carefully managed with appropriate treatment, as well as management and maintenance of those facilities and processes for the lifetime of the Proposed Development.

11.7 Summary

- 11.7.1 The Proposed Development has the potential to adversely impact the water environment during all phases of development, and thus as such, a water environment impact assessment has been scoped into the EIA. This will be supported by specific technical studies, such as a FRA, WFD Assessment, and consideration of nutrient neutrality for those aspects of the Proposed Development that fall within the Peak District Dales SAC Nutrient Neutrality Catchment.
- 11.7.2 Due to the early stage of the baseline studies details of all potential receptors are not yet known and further desk study and surveys are required to define these at subsequent stages of assessment. Similarly, due to the early stage of design development, the need for any abstraction or water, discharges of treated process water, physical impacts to water features such as access crossings of watercourses or the method of pipeline installation etc. are not yet known. As the design develops the need for more detailed surveys, monitoring or quantitative assessments will be determined in consultation with statutory consultees.

11.8 Scope and Methodology

- 11.8.1 This section outlines the scope and methodology that will be employed for assessing the likely significant effects on the water environment and flood risk.

Approach

- 11.8.2 At this stage a qualitative surface and groundwater water impact assessment is proposed to assess the potential effects, flood risk and WFD compliance, from the construction, operation and decommissioning of the Proposed Development. Baseline data will be derived from readily available online sources, data requests to third parties, walkover surveys and consultation with stakeholders. Impacts will be defined using a source-pathway-receptor approach, and the significant of effect determined by the application of standard criteria.
- 11.8.3 However, at this stage full details of the Proposed Development are not yet known, and thus there may be the need for additional surveys, assessment, and potentially quantitative studies (e.g. modelling). For example, process requirements at the four carbon capture plants may require changes to existing or new abstractions of water for cooling or the discharge of process waste water. As the project is developed the need for water or the chemical composition, rates and volumes of any discharges will need to be carefully defined. However, some waste chemicals commonly associated with carbon capture technology, such as amine, should not be discharged to the water environment and will generally need to be taken offsite for appropriate disposal elsewhere. Regulators will be consulted on the scope of any detailed studies.

Surface Water Runoff

- 11.8.4 The assessment of surface water runoff from areas that are unlikely to be contaminated will be in accordance with the National Standards for Sustainable Drainage (Ref 11-43) (and any local advice) with the risk to receiving waters determined using the Simple Index Approach as set out in the Construction Industries Research and Information Association (CIRIA) The SuDS Manual (Ref 11-44).

Potable Water Supply and Foul Drainage

- 11.8.5 The need for potable water supply and foul drainage will be kept under review but for now it is proposed that these matters are considered by the future assessment. It is expected that all of the existing cement and lime manufacturing sites have existing potable water supplies and foul drainage arrangements, and that these may be utilised for potable and foul drainage requirements during construction or future operation of the Capture Facilities. However, the cross-country pipeline may require a number of construction compounds and connection to the public sewer or mains water supply which maybe more challenging in rural areas. Pipeline integrity typically needs to be tested using water which depending on the source may require a biocide to be added (i.e. hydrostatic testing). The source of this water, how much is needed, and where it will be discharged will need to be determined, and the need for any additional quantitative studies agreed with the EA at a later stage.

Hydromorphological Impacts

- 11.8.6 A qualitative risk assessment of the risk to the physical form of watercourses from the construction or permanent development will be undertaken. Given the length of the pipeline a Watercourse Crossing Register will be created with a unique crossing reference for each watercourse that may be affected (noting that the precise locations are unlikely to be known when the DCO is submitted but will be within the Order Limits). A design optioneering exercise will be undertaken to determine a preferred option for each crossing. At this stage it is anticipated that intrusive (i.e. trenched) crossings will be used for smaller and less important watercourses, with non-intrusive (i.e. trenchless) options proposed for larger, more important watercourses (e.g. Horizontal Directional Drilling). This will be developed as the engineering design develops and then agreed with statutory consultees at a later stage. There are many factors to consider, and although trenchless options avoid direct impacts to the watercourse providing the pipeline is installed at sufficient depth, there remains the need to manage the risk of 'frac-out' events of drilling fluids, and the excavation of launch and receiving pits either side may interact with groundwater. If there are shallow confined aquifers trenchless techniques (that typically go deeper than trenched crossings) may not be appropriate.

Water Framework Directive Assessment

- 11.8.7 A WFD assessment will be carried out to ensure there is no deterioration or prevention of improvement to any WFD water body, taking into account the conservation objectives of any relevant Protected Areas. The assessment will need to consider both freshwater, groundwater and transitional waterbodies. It will be undertaken in accordance with Nationally Significant Infrastructure Projects: Advice on the Water Framework Directive (Ref 11-25) and the Clearing the Waters for All guidance (Ref 11-26). At this stage, a screening and scoping assessment will be undertaken, which will be consulted on before any further detailed WFD impact assessment is undertaken. The WFD assessment will be informed by and supported by quantitative water quality assessments, sediment studies and aquatic/marine ecology surveys.

Nutrient Neutrality Assessment

- 11.8.8 The Tarmac and Buxton Lime sites at Tunstead, plus the Pipeline (East) section all lie within the Peak District Dales SAC Nutrient Neutrality Catchment. Development in this catchment must not increase the amount of total phosphorus released into the water environment to protect the SAC. Nutrient neutrality typically applies to developments that affect the population of the catchment in the long term, but land use change and industrial emissions can be factors.
- 11.8.9 A Peak District Dales SAC Nutrient Budget Calculator has been produced (Ref 11-48) and can be used to estimate change in nutrient loads from a development, so that appropriate mitigation can be considered.
- 11.8.10 A Nutrient Neutrality Assessment is required but will be phased due to the type of development and will be undertaken in accordance with Government Guidance on using Nutrient Neutrality Calculators (Ref 11-49). Initially, a screening level of assessment would be undertaken for the development in the Peak District Dales SAC Nutrient Neutrality Catchment to determine whether there is the potential to increase emissions of TP. Natural England and the relevant local authorities would be consulted on the outcome of this screening assessment. If further assessment is required, the scope would be agreed at a later stage.

Flood Risk Assessment

- 11.8.11 This section outlines the methodology that is proposed to be used for the hydrology and flood risk assessment building on the general assessment methodology presented in Chapter 4.
- 11.8.12 Given the size of the Project and the presence of areas of Flood Zone 2 and 3 within the Study Area, an FRA of the Project will be produced in accordance with the requirements of the NPPF and PPG and local flood risk management guidelines published by the LLFAs and IDBs (Ref 11-45).

Determining Effects

- 11.8.13 The significance of effects will be determined using the principles of the guidance and criteria set out in the Design Manual for Roads and Bridges (DMRB) LA113 Road Drainage and the Water Environment (Ref 11-46) and DMRB LA 104 Environmental Assessment and Monitoring (Ref 11-47). The assessment methodology used in this chapter builds on and adapts the classification contained in DMRB.
- 11.8.14 Although these assessment criteria were developed for road infrastructure projects, this method is suitable for use on any development project and it provides a robust and well tested method for predicting the significance of effects. The criteria that will be used to determine receptors importance is presented in Table 11-12.

Table 11-12: Importance of Water Receptors

Importance	General Criteria	Surface Water	Flood Risk	Hydromorphology	Groundwater
Very high	The receptor has little or no ability to absorb change without fundamentally altering its present character, is of very high environmental value, or of international importance.	Major salmonid fishery. Watercourse having a WFD classification as shown in a River Basin Management Plan (RBMP) and $Q95 \geq 1.0 \text{ m}^3/\text{s}$; site protected/ designated under international or UK habitat legislation (SAC, SPA, SSSI, WPZ, Ramsar Site. Critical social or economic uses (e.g. public water supply and navigation).	Essential Infrastructure or highly vulnerable development.	Unmodified, near to or pristine conditions, with well-developed and diverse geomorphic forms and processes characteristic of river and lake type.	Source Protection Zone 1. Abstractions for public drinking water supply.
High	Receptor of national or regional importance with a low ability to absorb change without fundamentally altering its present character.	Watercourse having a WFD classification as shown in a RBMP and $Q95 < 1.0 \text{ m}^3/\text{s}$; Major Cyprinid Fishery; species protected under international or UK habitat legislation. Critical social or economic uses (e.g. water supply and navigation). Important social or economic uses such as water supply, navigation or mineral extraction.	More vulnerable development.	Conforms closely to natural, unaltered state and will often exhibit well-developed and diverse geomorphic forms and processes characteristic of river and lake type. Deviates from natural conditions due to direct and/or indirect channel, floodplain, bank modifications and/or catchment development pressures.	Principal Aquifer providing a regionally important resource or supporting a site protected under EU and UK habitat legislation. Source Protection Zone 2 and 3. Private water supplies for drinking water.

Importance	General Criteria	Surface Water	Flood Risk	Hydromorphology	Groundwater
Medium	Receptor of regional or local importance, with medium ability to absorb, adapt to or recover from change without significantly altering its present character.	Watercourse detailed in the Digital River Network but not having a WFD classification as shown in a RBMP. May be designated as a local wildlife Site (LWS) and support a small/ limited population of protected species. Limited social or economic uses.	Less vulnerable development.	Shows signs of previous alteration and/ or minor flow/ water level regulation but still retains some natural features or may be recovering towards conditions indicative of the higher category.	Secondary A Aquifer. Secondary B aquifer providing water supply to private abstractions. Abstractions for non-potable use.
Low	The receptor is of local importance and tolerant of change without detriment to its character (i.e. has some ability to absorb, adapt to or recover from change).	Surface water sewer, agricultural drainage ditch; non-aquifer WFD Class 'Poor' or undesignated in its own right. Low aquatic fauna and flora biodiversity and no protected species. Minimal economic or social uses.	Water compatible development.	Substantially modified by past land use, previous engineering works or flow/ water level regulation. Watercourses likely to possess an artificial cross-sector (e.g., trapezoidal) and will probably be deficient in bedforms and bankside vegetation. Watercourses may also be realigned or channelised with hard bank protection, or culverted and enclosed. May be significantly impounded or abstracted for water resources use. Could be impacted by navigation, with	Secondary B Aquifer. Secondary Undifferentiated Aquifer.

Importance	General Criteria	Surface Water	Flood Risk	Hydromorphology	Groundwater
				associated high degree of flow regulation and bank protection, and probable strategic need for maintenance dredging. Artificial and minor drains and ditches will fall into this category.	
Negligible	Receptor is resistant to change and is of little or no environmental value.	Not applicable.	Not applicable.	Not applicable.	Not applicable.

Note 1: Professional judgement is applied when assigning an importance category to all water features. The WFD status of a watercourse is not an overriding factor, and, in many instances, it may be appropriate to upgrade a watercourse which is currently at poor or moderate status to a category of higher importance to reflect its overall value in terms of other attributes and WFD targets for the watercourse. Likewise, a watercourse may be below Good Ecological Status, this does not mean that a poorer quality discharge can be emitted. All controlled waters are protected from pollution under the Environmental Permitting (England and Wales) Regulations 2016 and the Water Resources Act 1991, and future WFD targets also need to be considered.

11.8.15 In accordance with the stages of the methodology, there are three stages to the assessment of effects on the water environment, which are as follows:

- *Identification of Receptors* - Each identified receptor is assigned a level of importance (low to very high) based on a combination of attributes (such as the size of the watercourses, WFD designation, water supply and other uses, biodiversity, and recreation etc.) and on receptors to flood risk based on the vulnerability of the receptor to flooding (Table 11-12);
- *Identification of Potential Impacts* - The magnitude of potential and residual impact (or change) (classified as negligible, minor, moderate or major adverse / beneficial) is determined based on the criteria listed in Table 11- 12 and the assessor's professional judgment; and
- *Assessment of the Significance of Effects* - This is typically a function of the importance of a receptor and magnitude of the impact results in an assessment of the overall significance of the effect on the receptor using the matrix presented in Table 11- 13. The significance of each identified effect (both potential and residual) is classed as very large, large, moderate, slight or neutral and either beneficial or adverse significance.

11.8.16 Effects may be adverse and beneficial, direct or indirect, and permanent or temporary (including comments as to whether the effect could be reversed in the future). The duration of the effect may also be either 'short-term', 'medium-term' or 'long-term'. Short-term is considered to be up to 0 - 5 years, medium-term is considered to be between 5 and 15 years and long-term is considered to be greater than 15 years.

Magnitude

11.8.17 The magnitude of change on water environment receptors is independent of the sensitivity of the feature. This is largely reliant on professional judgement and is a more qualitative assessment although it may be informed by quantitative information and analysis where data is available and where appropriate. The assessment considers the scale and extent of predicted changes as well as the nature and duration of those changes. Table 11-13 defines the criteria for determining the magnitude of impacts.

Table 11-13: Criteria for Determining the Magnitude of Impacts

Magnitude of Impact	Criteria
Major Adverse	Results in loss of attribute and/or quality and integrity of the attribute
Moderate Adverse	Results in effect on integrity of attribute or loss of part of attribute
Minor Adverse	Results in some measurable change in attribute quality or vulnerability
Negligible	Results in some measurable change in attribute quality or vulnerability
Minor Beneficial	Results in some positive effect on an attribute or a reduced risk of negative effect occurring
Moderate Beneficial	Results in moderate improvement of attribute quality
Major Beneficial	Results in major improvement of attribute quality
No Change	No comment.

Assigning Significance

11.8.18 The importance of the receptor and the magnitude of change are determined independently from each other and are then used to determine the overall significance of effects (Table 11-14). A degree of professional judgement is also applied when determining the final effect grade.

Table 11-14: Significance Matrix (adapted from LA 104 Environmental Assessment and Monitoring (Ref 11-47))

Environmental Value (sensitivity)	Magnitude of Impact (Degree of Change)				
	No change	Negligible	Minor	Moderate	Major
Very High	Neutral	Slight	Moderate or large	Large or very large	Very large
High	Neutral	Slight	Slight or moderate	Moderate or large	Large or very large
Medium	Neutral	Neutral or slight	Slight	Moderate	Moderate or large
Low	Neutral	Neutral or slight	Neutral or slight	Slight	Slight or moderate
Negligible	Neutral	Slight	Neutral or slight	Neutral or slight	Slight

Assumptions and limitations

11.8.19 This scoping assessment has been undertaken based on information available at the time of reporting. To ensure transparency within the scoping process, the following limitations and assumptions have been identified:

- Baseline information has been derived from existing desk-based sources. No site visits or field-based surveys have been undertaken at this stage; therefore, the baseline data are indicative and high-level in nature.
- Data availability is currently limited. No information on water abstractions, private water supplies (PWS), or other relevant third-party datasets has been obtained to date. Additional information will be sought during subsequent stages of the EIA as appropriate.
- Scheme design remains subject to further development. There is uncertainty regarding process discharges, abstractions, and detailed design elements that may influence the assessment.
- It has been assumed that during decommissioning, the pipeline will be left in situ beneath all watercourse crossings.
- The assessment reflects conditions and information available at the time of reporting. As the scheme design evolves and additional data become available, the assessment findings and scope may be refined accordingly.

Summary of issues to be scoped in / out

11.8.20 Table 11-15 and Table 11-16 summarises the issues considered during scoping and indicates whether they are proposed to be included within, or scoped out of, the EIA, together with the justification for each decision.

Table 11-15: Water Environment and Flood Risk Scope – Capture Facilities

Water Environment and Flood Risk Scope – Capture Facilities				
Scope	Construction (C), Operation (O), Decommissioning (D)			Rationale
	C	O	D	
Scoped in ✓, scoped out ✗				
Potential water quality impacts on surface water receptors	✓	✓	✓	During all phases there is the potential for direct and indirect adverse impacts on water quality and water resources as set out in Section 11.6.
Potential water quality impacts on surface water receptors	✓	✓	✓	
Potential impacts on water resources (e.g. abstractions, PWS etc.)	✓	✓	✓	
Potential hydromorphological impacts on watercourses	✓	✓	✓	During construction there is the potential for temporary adverse impacts on the hydromorphology of watercourses. Permanent structures affecting watercourses, or longer-term abstractions or discharges can also result in hydromorphological impacts during operation. During decommissioning the removal of any structures affecting watercourses may result in a return to baseline conditions.
Water supply and foul drainage	✓	✓	✓	At this stage it is not known how potable water supplies and foul drainage will be managed during all phases and so on a precautionary basis these topics have been scoped in.
Flood Risk – Fluvial	✓	✗	✓	Potential to reduce the capacity of the existing floodplain storage and impact existing fluvial flows during construction and decommissioning. It is assumed that land will be returned to its original state during operation, however some facilities are partially located within Flood Zone 2 and 3 so will require further analysis upon confirmation of works at these sites.

Water Environment and Flood Risk Scope – Capture Facilities				
Flood Risk - Tidal	✗	✗	✗	Facilities are situated outside the tidal floodplain so not at risk from tidal flooding.
Flood Risk – Surface Water	✓	✗	✓	Potential to increase impermeable surfaces and impede existing or create surface water flow routes during construction and decommissioning. It is assumed no increase during operation as works are within existing facilities.
Flood Risk – Canal Breach	✗	✗	✗	No canals are within the site boundaries of the Carbon Capture facilities.
Flood Risk - Reservoirs	✗	✗	✗	Facilities are situated outside the predicted reservoir flood extent in the unlikely event of a breach.
Flood Risk – Sewer Infrastructure	✓	✓	✓	The existing risk of sewer flood risk could not be quantified in this assessment. This should be confirmed through further investigation at a later stage.
Flood Risk - Groundwater	✓	✓	✓	Potential for groundwater emergence and elevated groundwater flooding during all phases.

Table 11-16: Water Environment and Flood Risk Scope – Peak Cluster Pipeline and Coastal AGI to MLWS Pipeline(s)

Water Environment and Flood Risk Scope – Peak Cluster Pipeline and Coastal AGI to MLWS Pipeline(s)				
Scope Scoped in ✓, scoped out ✗	Construction (C), Operation (O), Decommissioning (D)			Rationale
	C	O	D	
Potential water quality impacts on surface water receptors	✓	✓	✓	During all phases there is the potential for direct and indirect adverse impacts on water quality and water resources as set out in Section 11.6.
Potential water quality impacts on surface water receptors	✓	✓	✓	

Water Environment and Flood Risk Scope – Peak Cluster Pipeline and Coastal AGI to MLWS Pipeline(s)				
Potential impacts on water resources (e.g. abstractions, PWS etc.)	✓	✓	✓	
Potential hydromorphological impacts on watercourses	✓	✓	✗	During construction there is the potential for temporary adverse impacts on the hydromorphology of watercourses. Permanent structures affecting watercourses, or longer-term abstractions or discharges can also result in hydromorphological impacts during operation. During decommissioning it is assumed that the pipeline will be left in situ under watercourses and thus there will be no adverse impact.
Water supply and foul drainage	✓	✗	✗	At this stage it is not known how potable water supplies and foul drainage will be obtained and managed during construction of the pipeline. The pipeline is expected to need to be hydrostatically tested. However, once installed there should be no requirement for water supply or foul drainage.
Flood Risk – Fluvial	✓	✓	✓	Potential to reduce the capacity of the existing floodplain storage and impact existing fluvial flows during all phases due to AGIs (e.g. Coastal AGI if located at the Landfall zone)
Flood Risk - Tidal	✓	✗	✓	The Coastal AGI to MLWS Pipeline(s) are situated within the tidal floodplain, beyond the flood defences along the Wirral, so at risk from tidal flooding during construction and decommissioning.
Flood Risk – Surface Water	✓	✓	✓	Potential to increase impermeable surfaces and impede existing or create surface water flow routes during all phases. As some AGIs may be located in FZ1 (e.g. Coastal AGI at landfall) there is potential for some AGIs to be located within a floodplain.
Flood Risk – Canal Breach	✓	✓	✓	The existing risk of canal breach could not be quantified in this assessment. This should be confirmed through further investigation at a later stage.
Flood Risk - Reservoirs	✗	✗	✗	The Coastal AGI to MLWS Pipeline(s) are situated within the predicted reservoir flood extent in the unlikely event of a breach. However, reservoirs present a managed risk and therefore the risk from reservoir flooding is considered residual.
Flood Risk – Sewer Infrastructure	✓	✓	✓	The existing risk of sewer flood risk could not be quantified in this assessment. This should be confirmed through further investigation at a later stage.

Water Environment and Flood Risk Scope – Peak Cluster Pipeline and Coastal AGI to MLWS Pipeline(s)

Flood Risk - Groundwater	✓	✓	✓	Potential for groundwater emergence and elevated groundwater flooding during all phases.

11.9 Planned Surveys

- 11.9.1 An initial site survey will be undertaken at an early stage in the design of the development to provide a high-level understanding of the characteristics of key water features within each site and along proposed pipeline routes. This survey can be carried out at any time but is best undertaken during the winter and early spring when visibility of the watercourses is likely to be greatest. It will seek to augment the desk study started at EIA Scoping by ground truthing the location, characteristics and flow direction of water features (excluding ponds as discussed earlier). Qualitative observations of the morphology of water features will be made and olfactory observations regarding their water quality noted.
- 11.9.2 At a later stage, and once a Watercourse Crossing Register has been prepared, additional targeted surveys will be undertaken to further assess the hydromorphology of watercourses that may be physically impacted by the Proposed Development. However, where access is not possible or visibility is difficult, drones may be used or proxy locations used as alternatives. In addition, some watercourses may be ephemeral or only intermittently flowing and thus depending on the timing of the survey may not be identifiable on the ground.
- 11.9.3 At this stage no water quality, flow or other monitoring is proposed, based on our experience with other similar developments. However, this will be kept under review as further details of the Proposed Development become available. If it is determined at a later stage that more detailed or quantitative assessments are required, it may be that some monitoring is required where existing background data is not available.
- 11.9.4 Information on any PWSs that may be affected by the Proposed Development will be obtained from the various Local Planning Authorities within the Study Area. Further investigations, including site visits to PWS and the issue of questionnaires may be required, if a PWS risk assessment is deemed necessary. The scope of this will be determined and agreed with the various Environmental Health Departments at a later stage of assessment.
- 11.9.5 Please refer to Chapter 6 Biodiversity for information on proposed ecological surveys.

11.10 References

- Ref 11-1** Environment Agency Catchment Data Explorer (2025). Available at:
<https://environment.data.gov.uk/catchment-planning/>
- Ref 11-2** HM Government (2021). Environment Act 2021. Available at:
<https://www.legislation.gov.uk/ukpga/2021/30/contents/enacted>
- Ref 11-3** HM Government (2014). Water Act 2014. Available at:
<https://www.legislation.gov.uk/ukpga/2014/21/contents>
- Ref 11-4** HM Government (2010). Flood and Water Management Act 2010. Available at:
<https://www.legislation.gov.uk/ukpga/2010/29/contents>
- Ref 11-5** HM Government (1995). Environment Act 1995. Available at:
<https://www.legislation.gov.uk/ukpga/1995/25/contents>
- Ref 11-6** HM Government (1991). Land Drainage Act 1991. Available at:
<https://www.legislation.gov.uk/ukpga/1991/59/contents>

- Ref 11-7** HM Government (1991). Water Resources Act 1991. Available at:
<https://www.legislation.gov.uk/ukpga/1991/57/contents>
- Ref 11-8** HM Government (1990). Environmental Protection Act 1990. Available at:
<https://www.legislation.gov.uk/ukpga/1990/43/contents>
- Ref 11-9** HM Government (1975). Salmon and Freshwater Fisheries Act 1975. Available at:
<https://www.legislation.gov.uk/ukpga/1975/51/contents>
- Ref 11-10** HM Government (1974). Control of Pollution Act 1974. Available at:
<https://www.legislation.gov.uk/ukpga/1974/40/contents>
- Ref 11-11** HM Government (2017). Water Environment (Water Framework Directive) (England and Wales) Regulations 2017. Available at:
<https://www.legislation.gov.uk/uksi/2017/407/contents>
- Ref 11-12** HM Government (2017). Environmental Permitting (England and Wales) Regulations 2016 (as amended 2017 & 2018) Available at:
<https://www.legislation.gov.uk/uksi/2016/1154/contents>
- Ref 11-13** HM Government (2015). Environmental Damage (Prevention and Remediation) Regulations 2015 Available at: <https://www.legislation.gov.uk/uksi/2015/810/contents>
- Ref 11-14** HM Government (2009). Flood Risk Regulations 2009. Available at:
<https://www.legislation.gov.uk/uksi/2009/3042/contents/made>
- Ref 11-15** HM Government (2009). Eels (England and Wales) Regulations 2009. Available at:
<https://www.legislation.gov.uk/uksi/2009/3344/made>
- Ref 11-16** HM Government (2009). Marine and Coastal Access Act 2009 Available at:
<https://www.legislation.gov.uk/ukpga/2009/23/contents>
- Ref 11-17** HM Government (2002). The Control of Substances Hazardous to Health Regulations 2002. Available at: <https://www.legislation.gov.uk/uksi/2002/2677/contents>
- Ref 11-18** HM Government (2001). Control of Pollution (Oil Storage) (England) Regulations 2001. Available at: <https://www.legislation.gov.uk/uksi/2001/2954/contents>
- Ref 11-19** Environment Agency (2025). Catchment Data Explorer Tool. Available at:
<https://environment.data.gov.uk/catchment-planning/>
- Ref 11-20** Environment Agency Flood Maps for Planning. Available at: <https://flood-map-for-planning.service.gov.uk/>
- Ref 11-21** Environment Agency Long-term Information Service: Check the long term flood risk for an area in England – GOV.UK <https://www.gov.uk/check-long-term-flood-risk>
- Ref 11-22** DEFRA, Multi-Agency Geographic Information for the Countryside (MAGIC) website.
- Ref 11-23** British Geological Survey. Online BGS GeoIndex website. Available at:
<https://www.bgs.ac.uk/map-viewers/geoindex-onshore/>
- Ref 11-24** Natural England (no date). Data published by Natural England. Available at: Search Results - data.gov.uk

- Ref 11-25** Nationally Significant Infrastructure Projects: Advice on the Water Framework Directive (Planning Inspectorate, March 2025 (version 1))
- Ref 11-26** Clearing the Waters for All guidance. Available at <https://www.gov.uk/guidance/water-framework-directive-assessment-estuarine-and-coastal-waters>
- Ref 11-27** Nationally Significant Infrastructure Projects: National Policy Statements. Available at: Nationally Significant Infrastructure Projects: National Policy Statements - GOV.UK
- Ref 11-28** Department for Environment, Food & Rural Affairs (2025). National Policy Statement for Water Resources Infrastructure. Available at: <https://www.gov.uk/government/publications/national-policy-statement-water-resources-infrastructure>
- Ref 11-29** Planning practice guidance. Available at: <https://www.gov.uk/government/collections/planning-practice-guidance>
- Ref 11-30** Wirral Local Plan 2022 to 2040. Available at: <https://www.wirral.gov.uk/planning-and-building/local-plans-and-planning-policy/wirral-development-plan/wirral-local-plan>
- Ref 11-31** Cheshire West and Chester Council Local Plan. Available at: <https://www.cheshirewestandchester.gov.uk/your-council/policies-and-performance/council-plans-policies-and-strategies/planning-policy/local-plan>
- Ref 11-32** Cheshire East Local Plan. Available at: <https://www.cheshireeast.gov.uk/planning/spatial-planning/cheshire-east-local-plan/cheshire-east-local-plan.aspx>
- Ref 11-33** Staffordshire Moorlands Council Local Plan. Available at: <https://www.staffsmoorlands.gov.uk/localplan>
- Ref 11-34** High Peak Borough Council Local Plan. Available at: <https://www.highpeak.gov.uk/article/646/The-Adopted-Local-Plan-2016>
- Ref 11-35** Derbyshire Dales Council Local Plan. Available at: <https://www.derbyshiredales.gov.uk/?catid=0&id=52>
- Ref 11-36** Humber River Basin Management Plan. Available at: <https://www.gov.uk/guidance/humber-river-basin-district-river-management-plan-updated-2022>
- Ref 11-37** North West River Basin Management Plan. Available at: North West river basin district river basin management plan: updated 2022 - GOV.UK
- Ref 11-38** Dee River Basin Management Plan. Available at: <https://www.gov.uk/guidance/north-west-river-basin-district-river-basin-management-plan-updated-2022>
- Ref 11-39** The UK Government's 25 Year Environment Plan. Available at: <https://www.gov.uk/government/publications/25-year-environment-plan>
- Ref 11-40** The UK Government's Environmental Improvement Plan. Available at: <https://www.gov.uk/government/publications/environmental-improvement-plan-2025>

- Ref 11-41** The UK Government's Future Water Strategy. Available at: Future water: <https://www.gov.uk/government/publications/future-water-the-government-s-water-strategy-for-england>
- Ref 11-42** National standards for sustainable drainage systems. Available at: <https://www.gov.uk/government/publications/national-standards-for-sustainable-drainage-systems/national-standards-for-sustainable-drainage-systems-suds>
- Ref 11-43** The Building Regulations 2010 Approved Document H Drainage and Waste Disposal. Available at: <https://www.gov.uk/government/publications/drainage-and-waste-disposal-approved-document-h>
- Ref 11-44** National Standards for Sustainable Drainage. Available at: <https://www.gov.uk/government/publications/national-standards-for-sustainable-drainage-systems/national-standards-for-sustainable-drainage-systems-suds>
- Ref 11-45** Construction Industry Research and Information Association (CIRIA) (2015). The SuDS Manual (C753). London: CIRIA.
- Ref 11-46** Flood risk assessments: applying for planning permission. Available at: <https://www.gov.uk/guidance/flood-risk-assessment-for-planning-applications>
- Ref 11-47** Highways England (2020). DMRB LA 113: Road Drainage and the Water Environment. Design Manual for Roads and Bridges (Volume 11 Sustainability & Environment, Appraisal). Revision 1. Available at: <https://www.standardsforhighways.co.uk/tses/attachments/d6388f5f-2694-4986-ac46-b17b62c21727>
- Ref 11-48** Highways England (2020). LA 104: Environmental assessment and monitoring. Design Manual for Roads and Bridges (DMRB), Volume 11: Sustainability & Environment, Revision 1. Available at: <https://www.standardsforhighways.co.uk/tses/attachments/0f6e0b6a-d08e-4673-8691-cab564d4a60a>.
- Ref 11-49** Peak District Dales SAC: nutrient neutrality calculator. Available at: <https://www.gov.uk/government/publications/peak-district-dailes-sac-nutrient-neutrality-calculator>
- Ref 11-50** Using the nutrient neutrality calculators. Available at: <https://www.gov.uk/guidance/using-the-nutrient-neutrality-calculators>
- Ref 11-51** Planning Policy Guidance: Flood Risk and Coastal Change. Available at: <https://www.gov.uk/guidance/flood-risk-and-coastal-change>
- Ref 11-52** National Planning Policy Framework: Meeting the challenge of climate change, flooding and coastal change. Available at: <https://www.gov.uk/guidance/national-planning-policy-framework/14-meeting-the-challenge-of-climate-change-flooding-and-coastal-change>
- Ref 11-53** Nationally Significant Infrastructure Projects: Advice on the Water Framework Directive. Available at: <https://www.gov.uk/guidance/nationally-significant-infrastructure-projects-advice-on-the-water-framework-directive>
- Ref 11-54** Local flood risk management guidelines published by the Lead Local Flood Authorities. Available at: <https://www.local.gov.uk/topics/severe-weather/flooding/local-flood-risk-management-strategies-lfrms-guidance>

Ref 11-55 Construction Industry Research and Information Association (CIRIA) publications.
Available at: CIRIA

Ref 11-56 National Highway Design Manual for Roads and Bridges (DMRB). Available at:
<https://nationalhighways.co.uk/suppliers/design-standards-and-specifications/design-manual-for-roads-and-bridges-dmr/>

Ref 11-57 National SuDS Standards. Available at:
<https://www.gov.uk/government/publications/national-standards-for-sustainable-drainage-systems/national-standards-for-sustainable-drainage-systems-suds>

12. Marine Environment

12.1 Introduction

- 12.1.1 The Scoping Boundary extends to Mean Low Water Spring (MLWS) at the north end of the Wirral Peninsula, which is located approximately 2.75 km from the shoreline. The Coastal AGI to MLWS pipeline(s) required as part of the Proposed Development is expected to be installed using a mixture of trenchless (e.g. HDD) and trenching methods within the intertidal area. The exact details are still to be established as part of the engineering design and more details will be presented with the Environmental Statement (ES) once they are available.
- 12.1.2 It should be noted that the DCO application for the Proposed Development:
- does not include any marine works beyond MLWS (consent for the offshore elements will be sought separately, and further information is provided within Section 1.2 of this Scoping Report); and
 - will include provisions for a deemed Marine Licence up to MLWS. Where such applications involve projects in certain areas, i.e. coastal and offshore, PA2008, Section 149A enables DCOs for NSIPs to include provisions deeming a marine licence to have been issued under sections 65–115 of the Marine and Coastal Access Act 2009 (MCAA 2009).
- 12.1.3 The description of the required activities within the coastal and intertidal area out to MLWS is yet to be fully established. However, it may comprise:
- the installation of the pipeline via trenchless techniques (e.g. via horizontal directional drilling);
 - the installation of the pipeline via trenching;
 - the installation of a cofferdam;
 - the potential installation of near shore block valve, which could be on the seabed;
 - dredging; and
 - activities near flood defences;
- 12.1.4 For the works proposed beyond MLWS, including the construction and operation of the pipelines, Spirit Energy will seek the necessary permissions from OPRED under the Offshore EIA Regulations 2020 and the Marine Management Organisation (MMO) under the Marine and Coastal Access Act 2009 (MCA Act 2009).
- 12.1.5 This Marine Environment chapter discusses the likely areas of marine assessments which may be required. These areas include:
- Marine Ecology;
 - Marine Archaeology;
 - Physical Processes; and
 - Marine Transport and Navigation.
- 12.1.6 The sections below discuss each of these areas in turn, describing the Study Areas, establishment of the baseline and data sources, planned surveys, identification of potential effects, mitigation, assessment methodology and consultation. The full scope of the assessments will depend on the extent of construction works required within the marine environment.

12.2 Marine Ecology

Defining the Study Area

- 12.2.1 The Study Areas for marine ecology would cover the area over which potential direct and indirect effects of the Proposed Development may occur during construction, operation (including maintenance) and decommissioning.
- 12.2.2 The direct effects on marine ecology receptors are those that occur within the footprint of the Proposed Development, such as the direct disturbance to benthic habitats and associated species as a result of construction. This is likely to be limited to the elements of the Proposed Development between the Wirral coast and MLWS where trenchless techniques are not utilised. Indirect effects are those that may arise outside this footprint, such as the potential noise disturbance effects on marine taxa, and passage and wintering birds during construction.
- 12.2.3 The Study Areas for marine ecology would be specific to each receptor, recognising both the mobility of each receptor and the likely impact pathways to that receptor. The marine ecology ES chapter would, through further analysis and assessment, confirm the Study Areas used for each receptor.

Summary of Data Sources

- 12.2.4 A desk-based study along with primary baseline data collection would be undertaken to inform the baseline conditions within the Study Areas. This would include the following key data sources below:
- Designated Sites:
 - MAGIC Interactive Map MAGIC Interactive Map (<http://www.magic.gov.uk>): Information on the boundaries of designated sites (Ref 12-1); and
 - Natural England Conservation Advice for Marine Protected Areas: Liverpool Bay SPA (Ref 12-2), Dee Estuary SPA (Ref 12-3) and Mersey Narrows & North Wirral Foreshore SPA (Ref 12-4).
 - Benthic habitats and species:
 - EMODnet seabed habitat mapping (Ref 12-5);
 - Project Specific Surveys including a Habitat Assessment (HAS) and Environmental Baseline Survey (EBS); and
 - Underwater video data would be acquired to characterise the benthic epifaunal assemblage(s) within the Study Area(s).
 - Fish and shellfish:
 - Review of fish and shellfish population data in the Liverpool Bay area from sources such as:
 - FishBase (Ref 12-6) for general fish ecology, distribution and biological information;
 - EMODnet biological data portal (Ref 12-7) for records of rarer fish and shellfish species;
 - Centre for Environment, Fisheries and Aquaculture Science (Cefas) Sensitivity Maps (Ref 12-8);

- The International Convention for the Conservation of Nature (IUCN) Red List of Threatened Species (Ref 12-9);
 - MMO landings statistics (Ref 12-10);
 - International Council for the Exploration of the Seas (ICES) data (Ref 12-11); and
 - EA Transitional and Coastal Waters (TraC) Fish Monitoring (Ref 12-12) - the results of the most recently available WFD fish monitoring for the nearest sites to the Proposed Development.
- Marine Mammals:
 - ICES Celtic Seas Ecosystem Overview (Ref 12-13);
 - Seal counts. Records of marine mammal sightings from the Cheshire Environmental Records Centre (Ref 12-14) and National Biodiversity Network (Ref 12-15);
 - SCANS (Small Cetacean Abundance in the European Atlantic and North Sea) data (Ref 12-16);
 - The Atlas of Cetacean Distribution in North-West European Waters (Ref 12-17); and
 - The Sea Watch Foundation marine mammal sightings distribution maps (Ref 12-18).
 - Passage and Wintering Birds:
 - Surveys for passage and wintering birds (commenced in October 2025) by Public Rights of Way (PRoW);
 - The British Trust for Ornithology (BTO) Wetland Birds Survey (WeBS) for records of wetland birds at coastal and inland WeBS count sectors;
 - High and Low Tide WeBS counts - monthly high and low tide wetland bird surveys will be performed along the foreshore in Hoylake where the scheme makes landfall between October 2025 and April 2026, inclusive;
 - Functionally Linked Land Surveys - monthly high and low tide functionally linked land walkover surveys will be performed along the length of the Wirral peninsula from where the scheme makes landfall south to the M56; and
 - Nocturnal Surveys – monthly high and low tide nocturnal surveys will be performed in the fields around the Coastal AGI locations at Hoylake between October 2025 and April 2026 inclusive.

Baseline Environment

Designated Sites

12.2.5 The Proposed Development's Scoping Boundary is situated within the following designated sites relevant to the marine environment:

- Mersey Narrows & North Wirral Foreshore SPA, SAC, Ramsar and SSSI - located on the Irish Sea coast of north-west England, on the mouths of the Mersey and Dee estuaries, the site comprises large areas of saltmarsh and extensive intertidal sand and mud flats, with limited areas of brackish marsh, rocky shoreline and boulder clay cliffs, along a mixed rural and industrial stretch of coast. The intertidal flats are internationally important feeding grounds for waders: the site regularly supports more than 20,000 waterbirds; and

- Dee Estuary SAC - designated for its 'mudflats and sandflats not covered by seawater at low tide', as well as *Salicornia* and other annuals which colonise in mud and sand.

12.2.6 Adjacent to the Proposed Development's Scoping Boundary is Liverpool Bay SPA. It is classified for the protection of red-throated diver (*Gavia stellata*), common scoter (*Melanitta nigra*), and little gull (*Hydrocoloeus minutus*) in the non-breeding season; common tern (*Sterna hirundo*) and little tern (*Sterna albifrons*) in the breeding season, and an internationally important waterbird assemblage.

Benthic Habitats and Species

12.2.7 Benthic habitats identified within the Scoping Boundary are generally dominated by areas of mud and sand, 'Infralittoral biogenic habitat' (EUNIS habitat MB2) (Ref 12-5). The Dee Estuary SAC and Mersey Narrows & North Wirral Foreshore SPA is designated as described in 12.2.5.

Fish and Shellfish

12.2.8 The Scoping Boundary falls within the MMO North West Inshore Marine Plan area and the ICES rectangle 35E6; the district of the North Western Inshore Fisheries and Conservation Authority (NEIFCA) and the Leasowe and New Brighton Shellfish Classification Zone (ID 3070), designated for cockles.

Marine Mammals

12.2.9 Within the Celtic Seas Ecosystem, fourteen cetacean species (which are protected under the Wildlife and Countryside Act 1981) either occur commonly or are regular visitors, namely:

- Minke whale (*Balaenoptera acutorostrata*);
- Fin whale (*Balaenoptera physalus*);
- Harbour porpoise (*Phocoena phocoena*);
- Bottlenose dolphin (*Tursiops truncatus*);
- Common dolphin (*Delphinus delphis*);
- White-beaked dolphin (*Lagenorhynchus albirostris*);
- Atlantic white-sided dolphin (*Lagenorhynchus acutus*);
- Risso's dolphin (*Grampus griseus*);
- Long-finned pilot whale (*Globicephala melas*);
- Killer whale (*Orcinus orca*);
- Northern bottlenose whale (*Hyperoodon ampullatus*);
- Sowerby's beaked whale (*Mesoplodon bidens*);
- Cuvier's beaked whale (*Ziphius cavirostris*); and
- Sperm whale (*Physeter macrocephalus*).

12.2.10 Within the Celtic Seas Ecosystem, two species of seal commonly occur in the Celtic Seas: grey seal (*Halichoerus grypus*) and harbour seal (*Phoca vitulina*) both of which are protected under the Seal Protection Act 1970. The abundance of grey seals in the ecoregion is stable, and there is little information on the overall population trends of harbour seals and cetaceans.

Passage and Wintering Birds

12.2.11 The intertidal flats of the Wirral coastline are internationally important feeding grounds for passage and wintering waders: the Mersey Narrows & North Wirral Foreshore SPA regularly supports more than 20,000 waterbirds and Liverpool Bay SPA (adjacent to the Proposed Development's Scoping Boundary) is classified for the protection of red-throated diver (*Gavia stellata*), common scoter (*Melanitta nigra*), and little gull (*Hydrocoloeus minutus*) in the non-breeding season; common tern (*Sterna hirundo*) and little tern (*Sterna albifrons*) in the breeding season, and an internationally important waterbird assemblage.

Overview

12.2.12 The full marine ecology baseline would be established for the Preliminary Environmental Information Report (PEIR) which will be prepared to support the Statutory Consultation. This will report on the following within the Study Areas:

- Designated Sites: all designated sites within the Scoping Boundary and the Study Area, as well as their reasons for designation;
- Benthic Ecology: the intertidal habitats and assemblages, subtidal habitats and communities present in the Study Area;
- Fish and Shellfish: migratory fish species, commercial fisheries and shellfish species and general fish and shellfish present in the Study Area;
- Marine Mammals: cetaceans and pinnipeds present in the Study Area; and
- Passage and wintering birds present in the Study Area.

Future Baseline

12.2.13 If the Proposed Development were not to take place, marine ecology receptors, namely designated sites, benthic ecology, fish and shellfish, marine mammals and coastal waterbirds, would continue to be influenced by natural and human-induced variability, ongoing cyclic patterns and trends. The future baseline would also be influenced by climate change, ocean acidification and increases in non-native species. These could lead to changes in distribution, abundance, health and reproduction in marine species, potentially affecting future populations.

Planned Surveys

12.2.14 A HAS and EBS are to be conducted which will acquire drop-down camera visuals at grab sample stations and in any areas of potential sensitive habitat. This will be followed by the acquisition of a series of samples at each station.

12.2.15 The HAS will include:

- General review of geophysical survey seabed data and interpretation seabed features and habitat changes within the survey area. If features identified could represent sensitive biological communities, suitable photographic investigations shall be undertaken to positively identify these features;
- Ground-truthing of potential habitats – drop down video and seabed photography to be acquired at each station with potential Annex I habitats to be assessed and delineated; and
- A minimum of 5 stills and 5 minutes of video footage at each location, ensuring care is taken to take during adequate weather/tidal conditions where possible.

12.2.16 The EBS will :

- Sample every 1 km along the route and potentially limit the number of samples where the seabed is found to be homogenous for efficiency;
- Vary the station locations based on the seabed sediment interpretation from the seabed data;
- Not take samples in any sensitive habitats or Annex I Habitats; and
- Offset the samples from the pipeline route centreline and alternate them on either side where possible.

12.2.17 It is not currently anticipated that site specific fish or marine mammal surveys will be required for the Proposed Development given that the existing available data sources are adequate for the purposes of characterising these receptors in the study area as part of the EIA and HRA. However, this will be reviewed as the project progresses and discussed with key consultees.

12.2.18 Coastal Bird Surveys will be undertaken as SPA species may use both terrestrial and intertidal habitats (refer to Chapter 6 of this Scoping Report).

Identification of Potential Impacts

12.2.19 The potential impact pathways of the Proposed Development are as follows:

Potential Construction Impacts

- Designated sites:
 - Loss of habitat, loss/fragmentation of habitat supporting protected and notable species as a result of permanent and temporary land take, surface water and groundwater pollution, and dust emissions.
- Benthic habitats and species:
 - Temporary direct loss and physical disturbance from the use of vessels to benthic habitats and species;
 - Effects to marine ecology from changes in marine water quality due to accidental spills from vessels and surface run-off from land-based construction activities;
 - Direct changes to benthic habitats and species as a result of the potential block valve, piling, capital dredging and dredge disposal;
 - Indirect changes to benthic habitats and species as a result of changes to hydrodynamic and sedimentary processes during piling, capital dredging and dredge disposal;
 - Changes in water and sediment quality during piling, capital dredging and dredge disposal;
 - Underwater noise and vibration disturbance during piling, capital dredging and dredge disposal; and
 - Introduction and spread of non-native species through the use of marine plant and introduction of new infrastructure.
- Fish and shellfish:
 - Direct loss or changes to fish populations and habitat as a direct result of capital dredging and dredge disposal;
 - Changes in water and sediment quality during capital dredging and dredge disposal; and
 - Underwater noise and vibration disturbance during construction.

- Marine mammals:
 - Underwater noise and vibration disturbance during construction;
 - Direct loss or changes in marine mammal foraging habitat;
 - Collision risk during construction; and
 - Water quality impacts during capital dredging and dredge disposal.
- Passage and Wintering Birds:
 - Effects from marine ecology from changes in existing lighting conditions during construction.

Potential Operational Impacts

- Benthic habitats and species
 - Direct changes to benthic habitats and species as a result of sediment removal and deposition during operation (specifically piling, maintenance dredging, dredge disposal (if required) and due to operational berth vessel movements) and the potential block valve;
 - Indirect changes to benthic habitats and species as a result of changes to hydrodynamic and sedimentary processes during operation;
 - Underwater noise and vibration disturbance during operation; and
 - Introduction and spread of non-native species.
- Fish and shellfish
 - Changes to fish populations and fish habitat during operation (as a result of maintenance dredging, and dredge disposal if required);
 - Changes in water and sediment quality during operation (as a result of maintenance dredging and dredge disposal if required);and
 - Underwater noise and vibration disturbance operation.
- Marine Mammals
 - Underwater noise and vibration disturbance during operation.

Potential Decommissioning Impacts

12.2.20 The pipeline would likely remain in situ at the decommissioning phase and as a result no potential decommissioning impacts are anticipated. If the nearshore block valve had been required and installed, this would be removed in accordance with the appropriate legislation, standards and guidance at the time of decommissioning and any impacts associated with this works assessed.

Mitigation

- 12.2.21 Mitigation measures would be considered as part of the assessment to avoid or reduce potential impacts, as far as reasonably practicable, to environmentally acceptable levels. This would include consideration of embedded mitigation which assesses modifications to the location or design of the development made during the pre-application phase. Those modifications are then embedded as part of the Proposed Development, such as minimising the development footprint.
- 12.2.22 The assessment would also consider standard best practices to manage commonly occurring environmental effects (such as the implementation of biosecurity measures) and where required the use of secondary mitigation. Additional mitigation measures would be further developed if

required through ongoing engagement with statutory authorities as part of the statutory consultation process.

Consultation

- 12.2.23 Key consultees for this topic include the MMO, Natural England, the EA, and the Joint Nature Conservation Committee. Initial consultation meetings were held with Natural England and the EA in late 2025, as well as with the MMO in January 2026.

Assessment Methodology

- 12.2.24 The EclA will be completed in accordance with the latest CIEEM Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine (Ref 12-19).
- 12.2.25 Chapter 4 of this EIA Scoping Report contains more information on the assessment methods. A full assessment methodology for marine ecology will be presented in the PEIR as required.

12.3 Marine Archaeology

Defining the Study Area

- 12.3.1 The Study Area is the area over which potential direct and indirect effects of the Proposed Development may occur on Marine Archaeology assets during construction, operation and decommissioning. Direct effects on marine archaeology / heritage receptors are those confined to within the footprint of the Proposed Development i.e. the marine infrastructure construction works, dredge and disposal of dredge arisings (if required). Indirect effects are those that may arise due to wider changes in the estuary flow and sedimentary regime and any change to the estuary morphology as a result of the Proposed Development.
- 12.3.2 The Study Area for the marine archaeology topic would comprise the Scoping Boundary from the coastline to MLWS associated with the Proposed Development and a 2 km buffer zone. This would be used to capture relevant data on designated and non-designated marine archaeological assets, and to provide the necessary context for understanding archaeological potential and heritage significance of assets that may be affected by the Proposed Development.
- 12.3.3 The marine archaeology ES chapter may, through further desk-based analysis and assessment, refine the Study Area for the purposes of the impact assessment.

Summary of Data Sources

- 12.3.4 A desk-based study would be undertaken to inform the current baseline characterisation with regard to marine archaeology. This would include consideration of the following data sources:
- UKHO data for charted wrecks and obstructions;
 - Cheshire Historic Environment Records (HER) for known maritime and aircraft wrecks, coastal installations, archaeological sites, and events records;
 - National Record of the Historic Environment (NRHE) terrestrial and marine cultural heritage assets maintained by Historic England;
 - The United Kingdom Hydrographic Office (UKHO) wreck database for information regarding live wrecks, salvaged wrecks and dead wrecks;
 - Various online resources including the British Geological Survey (BGS) Geology of Britain Viewer and the local planning portal for the Local Plan and other planning information;

- Published and unpublished literature (including a detailed review of reports for previous fieldwork carried out within the proximity to the Proposed Development); and
- Existing geotechnical, geophysical and geoarchaeological data.

12.3.5 The baseline summary for seabed prehistory would be based on a review of geological mapping of seabed sediments, solid geology and bathymetry from published BGS sources. This would be enhanced by review of existing geotechnical, geophysical and geoarchaeological data.

Baseline Environment

12.3.6 The marine archaeology baseline would be established for the PEIR which will be prepared to support the Statutory Consultation. This will report on the full marine archaeology baseline including:

- Designated assets;
- Undesignated assets;
- Aviation archaeology (designated and undesignated);
- Submerged prehistoric archaeology and palaeolandscapes;
- Maritime and shipwreck archaeology; and
- Aviation or aircraft archaeology.

12.3.7 This would be further expanded and developed as part of the ES.

Future Baseline

12.3.8 In the absence of the Proposed Development, future baseline conditions for marine archaeology assets are anticipated to remain unchanged from those as described above.

Planned Surveys

12.3.9 An archaeological assessment of geophysical survey data in the vicinity of the proposed works would be undertaken. This would comprise multibeam echosounder, sidescan sonar and magnetometry surveys.

12.3.10 Further primary data will be obtained from geophysical and geotechnical surveys covering the Proposed Development. The data will be archaeologically assessed to provide a full assessment of the known and potential underwater heritage receptors down to MLWS.

12.3.11 An intertidal walkover survey will be undertaken at the landfall options in order to ground truth previously recorded heritage receptors and to identify any new receptors that may be of relevance to the assessment.

12.3.12 The results will be incorporated into a full desk-based assessment, which will be undertaken using data from the UKHO, and national and local authority sources.

Identification of Potential Effects

12.3.13 The Proposed Development may have the potential to affect marine archaeology assets or deposits of archaeological importance during both construction and operation phases. The marine archaeology ES chapter would set out the assessment of the likely changes to be generated by the Proposed Development, both beneficial and adverse and during both the construction and operational phases.

12.3.14 The sections below consider the potential marine archaeology effects during construction and operation of the Proposed Development, and whether defined impact pathways have the potential to result in significant effects.

Potential Construction Impacts

- Partial or total removal of heritage assets; and
- Compaction of archaeological deposits by structures.

Potential Operational Impacts

12.3.15 There will be no physical impact upon any heritage assets during operation of the Proposed Development.

Potential Decommissioning Impacts

12.3.16 The pipeline would likely remain in situ at the decommissioning phase and as a result no potential decommissioning impacts are anticipated. If the nearshore block valve is required and installed, this would be removed in accordance with the appropriate legislation, standards and guidance at the time of decommissioning and any impacts associated with this works assessed.

Mitigation

- 12.3.17 Typically, adequate and appropriate mitigation is required to ensure that the archaeological value of the baseline is maintained. International best practice and government policy favours preservation in situ of the archaeological resource.
- 12.3.18 Mitigation measures would be secured through a Written Scheme of Investigation (WSI), but the exact mitigation design would not be finalised until the assessment in the ES has been undertaken. Mitigation measures could include the use of Archaeological Exclusion Zones (AEZs), further investigation of anomalies (such as through unexploded ordnance (UXO) surveys), and the implementation of a Protocol for Archaeological Discoveries. Measures to be undertaken during the construction phase would be detailed in the CEMP.

Consultation

12.3.19 Key consultees for marine archaeology include the Marine Management Organisation (MMO), the Crown Estate, Historic England and Wirral Council.

Assessment Methodology

- 12.3.20 A Desk-Based Assessment (DBA) would be prepared in accordance with industry standards and best practice guidelines, namely the ClfA Standard and Guidance for historic environment Desk-Based Assessment (Ref 12-28), and any responses received as part of the scoping phase and consultation. The DBA would form an appendix to the ES and would inform the marine archaeology ES chapter. This DBA would include the analysis of geophysical and geotechnical datasets.
- 12.3.21 The EIA documents would be prepared following standard industry practice and guidance for marine archaeology, including but not limited to the following:
- Conservation Principles, Policies and Guidance for the Sustainable Management of the Historic Environment (Ref 12-27);
 - ClfA Standard and Guidance for Archaeological Advice by Historic Environment Services (2020) (Ref 12-28);

- ClfA Standard and Guidance for Historic Environment Desk-based Assessment (2020) (Ref 12-29);
- HM Government (2009) Our Seas – a shared resource: High level marine objectives (Ref 12-30); and
- Joint Nautical Archaeology Policy Committee (JNAPC) (2006) Code of Practice for Seabed Development (Ref 12-31).

- 12.3.22 The EIA would follow the methodology set out in Chapter 4 EIA Approach and Methodology. Marine heritage receptors cannot typically adapt, tolerate, or recover from physical impacts resulting in material damage or loss caused by development. Consequently, the sensitivity of each receptor would be predominantly quantified only by its importance.
- 12.3.23 The importance of marine heritage receptors would be established using criteria based on Conservation Principles, Policies and Guidance for the Sustainable Management of the Historic Environment (Ref 12-32) and Ships and Boats: Prehistory to Present: Designation Selection Guide (Ref 12-33).

12.4 Physical Processes

Study Area

- 12.4.1 The Study Area is the area over which potential direct and indirect effects of the Proposed Development may occur during construction and operation. The direct effects on physical processes are those confined to within the marine footprint of the Proposed Development. Indirect effects are those that may arise due to wider changes in the estuary flow and sedimentary regime and any change to the estuary morphology as a result of the Proposed Development.
- 12.4.2 The Study Area for the physical processes topic is considered to be the Scoping Boundary from the Wirral coastline down to MLWS. Once the Pre-FEED work has advanced further, the exact construction works required within the intertidal will be confirmed. Following this, it may be necessary to extend the Study Area further to ensure that all potential impacts are considered within the assessment. The physical processes ES chapter would, through further desk-based analysis and assessment, including numerical modelling, refine the Study Area for the purposes of the impact assessment as necessary.

Summary of data sources

- 12.4.3 A desk-based study would be undertaken to inform the current baseline characterisation with regards to physical processes. This would include consideration of the following data sources:
- BGS Geology Viewer (Ref 12-20);
 - Suspended Sediment Climatologies around the UK (Ref 12-21);
 - Admiralty Tide Tables (Ref 12-22);
 - Renewables Atlas (Ref 12-23);
 - SEASTATES (Ref 12-24);
 - North West England and North Wales Shoreline Management Plan SMP2 and supporting studies (Ref 12-25); and
 - UK Climate Projections User Interface (Ref 12-26).

Baseline Environment

12.4.4 The full physical processes baseline would be established for the PEIR which will be prepared to support the Statutory Consultation and further expanded upon in the ES. This will report on the following:

- Bathymetry and morphology;
- Tides and water levels;
- Surge levels;
- Sea level rise;
- Flows;
- Waves; and
- Geology and sediments.

Future Baseline

12.4.5 Hydrodynamic and sedimentary processes would continue to be influenced by natural and human-induced variability, ongoing cyclic patterns and trends (e.g. ongoing maintenance dredging and disposal) with or without the Proposed Development.

12.4.6 The future baseline would also be influenced by climate change and, in particular, increased rates of mean sea level rise (SLR). Water levels in the future, as now, would also be affected by unpredictable surge and weather-related events.

Planned Surveys

12.4.7 A geophysical survey and EBS are to be conducted acquiring multibeam echosounder, side scan sonar and magnetometer data.

Identification of Potential Effects

12.4.8 The physical processes assessment would consider the likely changes arising from the Proposed Development, both beneficial and adverse and during both the construction and operational phases.

12.4.9 The sections below consider the potential physical processes effects during the construction and operation, and whether defined impact pathways have the potential to result in significant effects.

Potential Construction Impacts

12.4.10 The potential physical processes impact pathways during the Proposed Development construction phase are as follows:

- Increased SSC and potential sedimentation over the extent of the disturbance plume as a result of construction;
- Increased SSC and potential sedimentation as a result of the deposit of capital dredge material at a licensed offshore disposal site (if required); and
- Changes in seabed bathymetry and composition as a result of deposition of dredged/ disposal material (if required) within the area of the respective plumes.

12.4.11 At the current stage there is considered to be insufficient evidence to exclude any potential construction pathways from further assessment within the EIA.

Potential Operational Impacts

- 12.4.12 Local changes to hydrodynamic regime (flow speed and direction) as a result of the potential block valve, piling and capital dredging (if required):
- Associated local changes to the sediment transport pathways, as a result of localised changes to the driving hydrodynamic (and wave) forcing;
 - Increased SSC and potential sedimentation in the area of dispersal plume as a result of maintenance dredging (if required). e. Increased SSC and potential sedimentation as a result of deposition of maintenance dredge material at a licensed disposal site (if required);
 - Changes in seabed bathymetry and composition as a result of deposition of dredged/ disposed maintenance dredge material (if required); and
 - Possible future exposure risk of pipeline in areas subject to active sediment migration

Potential Decommissioning Impacts

- 12.4.13 The pipeline would likely remain in situ at the decommissioning phase and so there are no potential decommissioning impacts anticipated with the pipeline itself. If the nearshore block valve is required and installed, this would be removed in accordance with the appropriate legislation, standards and guidance at the time of decommissioning and any impacts associated with this works assessed.

Mitigation

- 12.4.14 The Proposed Development's would be designed to minimise potential changes to the physical processes of Liverpool Bay, whilst ensuring operational viability and safety. The requirement for mitigation measures would be defined in the ES, taking account of the physical processes impact assessment.

Assessment Methodology

- 12.4.15 The methods adopted for the assessment of the physical processes changes would be slightly different to those adopted for other environmental topics. This is because whilst the Proposed Development may have the potential to cause changes to hydrodynamic and sedimentary processes, these changes are not, in themselves, generally recognised as environmental features/ receptors and, therefore, do not equate to 'effects'. The effects would instead be the consequence of these changes on other environmental features. For example, 'changes' in the transport and deposition of sediment may 'effect' the structure and function of marine habitats and their associated species.
- 12.4.16 The assessment undertaken in relation to this topic, would apply the same impact assessment methodology as described in Chapter 4 EIA Approach and Methodology and would assess the potential 'exposure to change' resulting from the impact pathways the assessment. The consequent significance of effects resulting from physical processes changes on other environmental features/ receptors would be assessed in other topic-specific ES chapters, including Marine Biodiversity, Water Environment and Flood Risk.

Consultation

- 12.4.17 Key consultees for the physical processes assessment would include the MMO, along with Centre for Environment, Fisheries and Aquaculture Science (Cefas) as their technical advisors, and the EA.

Assessment Methodology

- 12.4.18 The methods adopted for the assessment of the physical processes changes would be slightly different to those adopted for other environmental topics. This is because whilst the Proposed Development may have the potential to cause changes to hydrodynamic and sedimentary processes, these changes are not, in themselves, generally recognised as environmental features/ receptors and, therefore, do not equate to 'effects'. The effects would instead be the consequence of these changes on other environmental features. For example, 'changes' in the transport and deposition of sediment may 'effect' the structure and function of marine habitats and their associated species.
- 12.4.19 The assessment undertaken in relation to this topic, would apply the same impact assessment methodology as described in Chapter 4 EIA Approach and Methodology and would assess the potential 'exposure to change' resulting from the impact pathways the assessment. The consequent significance of effects resulting from physical processes changes on other environmental features/ receptors would be assessed in other topic-specific ES chapters, including Marine Biodiversity, Water Environment and Flood Risk.

12.5 Marine Transport and Navigation

Study Area

- 12.5.1 The Port of Liverpool, Port of Birkenhead and Port of Tranmere are all located within the vicinity of the Proposed Development. The Port of Liverpool is a major UK port known for its strategic location, diverse cargo handling capabilities, and significant historical importance in global trade.
- 12.5.2 The marine area of the Scoping Boundary for the Proposed Development comprises an area from the Wirral coastline to MLWS. The Study Area for the Marine Transport and Navigation is the area over which potential direct and indirect effects of the Proposed Development may occur during construction and operation.
- 12.5.3 As part of the exercise leading to the finalisation of the marine transport and navigation ES chapter, a further desk-based analysis and assessment would be undertaken to refine the Study Area for the purposes of the assessment.

Summary of data sources

- 12.5.4 A desk-based study would be undertaken to inform the baseline characterisation on which the assessment would be based. This would include consideration of the following types of data:
- Accident and Incident data;
 - Vessel Simulation Study and Swept Path Analysis;
 - Weather and environmental based ephemeral and almanac data;
 - Automatic Identification System (AIS) data from a range of sources including the Marine Management Organisation (MMO);
 - Vessel movement statistics; and
 - Navigational features and charted information from United Kingdom Hydrographic Office (UKHO) Admiralty Charts.

Baseline Environment

12.5.5 The baseline would be established for the PEIR which will be prepared to support the Statutory Consultation. This will report on the following:

- Commercial navigation: including commercial shipping movements, commercial passage to and from ports in the area;
- Recreational navigation; and
- Information on statutory authorities in the area.

Planned Surveys

12.5.6 No further primary data surveys are proposed to inform the EIA.

Identification of Potential Effects

12.5.7 The Proposed Development has the potential to affect commercial and recreational navigation during both construction and operational phases. The Marine Transport and Navigation PEIR and ES chapter would set out the assessment of the likely effects created by the Proposed Development.

12.5.8 The sections below consider the potential marine transport and navigation impact pathways during construction and operation, and whether defined potential significant effects may result.

Potential Construction Impacts

12.5.9 The potential marine transport and navigation impact pathways during construction are as follows:

- Collision due to displacement of shipping and/ or increase in vessel density during the construction of the Proposed Development;
- Collision of passing vessels with works craft: as passing vessels (commercial, recreational or fishing) are manoeuvring around or in close proximity to the works there is the potential for collision with craft associated with the Proposed Development;
- Collision during navigation: vessel collision (commercial or recreational or fishing) with works craft; and
- Payload related incidents: if lifting operations are required from barges/ vessels associated with the Proposed Development, there is potential for incidents to arise from dropped items or affected vessel stability.

12.5.10 A separate Navigational Risk Assessment (NRA) would likely be required for the Proposed Development. As part of the NRA process, a hazard identification workshop would be held to identify the potential impacts associated with the Proposed Development. Each of these impacts would be assessed and those which are significant would be taken through to inform the marine transport and navigation chapter of the ES.

Potential Operational Impacts

12.5.11 There would be no regular requirement for additional vessels during operation and so there would be no impact pathways.

Potential Decommissioning Impacts

12.5.12 The pipeline would likely remain in situ at the decommissioning phase and as a result no potential decommissioning impacts are anticipated.

Mitigation

- 12.5.13 Within the Ports & Marine Facilities Safety Code (PMSC) (**Ref 12-27**), ‘as low as reasonably practicable’ (ALARP) is an industry wide concept applying to both health and safety and port marine safety. The core concept is that of ‘reasonably practicable’ which involves weighing up risk against the effort, time and money needed to control it. The PMSC specifically references ALARP in respect of the MSMS and NRAs.
- 12.5.14 From the NRA process, a set of mitigation measures or mitigation controls would be identified, which would be implemented either directly into the Proposed Development design, or via management practices. The overall objective is to maintain risk levels within a limit that is deemed ALARP. By virtue of the marine environment, these controls would be embedded within the background navigational environment, and include:
- Vessel traffic management and the reactive response to marine emergencies (following notification by the contractor/ operator);
 - Professional/ trained mariners application of:
 - IMO conventions of Safety of Life at Sea;
 - International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW).
 - Convention on the International Regulations for Preventing Collisions at Sea (COLREGS), 1972; and
 - Ensuring compliance with The International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) guidance on Aids to Navigation (AtoN).

Assessment Methodology

- 12.5.15 The data sources which would be used to gather the baseline information for the NRA and to inform the ES are noted in the data sources section above.
- 12.5.16 In order to assess the potential impacts of the Proposed Development upon commercial shipping and recreational navigation, relative to the baseline, a combination of analytical methods and expert judgement would be used. This will include qualitative assessments of data along with consideration of the existing evidence base and empirical evaluation.
- 12.5.17 An NRA will be required to support the DCO application for the Proposed Development. The NRA outputs would inform the marine transport and navigation assessment, and the NRA will be provided as an appendix to the ES. To provide local stakeholder input, a hazard identification workshop will be arranged which would bring together relevant navigational stakeholders for the area to discuss the potential impacts on navigational safety associated with the Proposed Development.
- 12.5.18 Following the risk assessment process and full consideration of navigation hazards brought about by the Proposed Development, the need to have further controls would be decided upon. Decisions relating to further controls would be finalised by an appropriate authority to determine whether an as low as reasonably practicable (ALARP) state has been met for each risk. This would determine whether the Proposed Development 's residual impacts have been reduced to an ALARP state in the context of a cost-benefit analysis as defined and applied within the guidance in the PMSC.

12.5.19 The outputs of the NRA will be used to inform a judgement on significance of effects arising from the Proposed Development, which would be reported in the EIA.

Consultation

12.5.20 In order to inform the Shipping and Navigation Assessment and NRA, consultation with key maritime stakeholders relevant to the Proposed Development's location be undertaken in order to obtain supplementary information, which may not be available through the data sources outlined above. Parties consulted will include, but may not be limited to:

- Maritime and Coastguard Agency (MCA);
- Northern Lighthouse Board (NLB);
- Trinity House;
- Chamber of Shipping;
- The Royal Yachting Association (RYA);
- Commercial Fisheries representatives;
- Relevant port and harbour authorities including:
- The Port of Liverpool;
- Port of Birkenhead; and
- Port of Tranmere.

12.6 References

- Ref 12-1** Multi-Agency Geographic Information for the Countryside (MAGIC) website. Available at: <https://magic.defra.gov.uk/>
- Ref 12-2** Natural England (2009). Natural England Conservation Advice for Marine Protected Areas: Liverpool Bay SPA. Available at: <https://publications.naturalengland.org.uk/publication/3236717>
- Ref 12-3** Natural England (2015). Natural England Conservation Advice for Marine Protected Areas: Dee Estuary. Available at: <https://designatedsites.naturalengland.org.uk/ConservationAdvice.aspx?SiteCode=UK9013011&SiteName=Dee%20Estuary&SiteNameDisplay=The%20Dee%20Estuary%20SPA&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=&HasCA=0&NumMarineSeasonality=14&SiteNameDisplay=The%20Dee%20Estuary%20SPA>
- Ref 12-4** Natural England (various). Conservation Advice for Marine Protected Areas: Mersey Narrows & North Wirral Foreshore SPA. Available at: <https://designatedsites.naturalengland.org.uk/ConservationAdvice.aspx?SiteCode=UK9020287&HasCA=1&NumMarineSeasonality=5&SiteNameDisplay=Mersey%20Narrows%20and%20North%20Wirral%20Foreshore%20SPA>
- Ref 12-5** EMODnet seabed habitat mapping. Available at: <https://www.emodnet-seabedhabitats.eu/access-data/launch-map-viewer/?zoom=3&center=-15.000,51.600&layerIds=3&baseLayerId=-3&activeFilters=>
- Ref 12-6** FishBase. Available at: www.fishbase.org

- Ref 12-7** EMODnet biological data portal. Available at: <http://www.emodnet.eu/biology>
- Ref 12-8** Centre for Environment, Fisheries and Aquaculture Science (Cefas) (1998) Fisheries Sensitivity Maps in British Waters . Available at: https://www.cefas.co.uk/media/o0fgfobd/sensi_maps.pdf
- Ref 12-9** The International Convention for the Conservation of Nature (IUCN) Red List of Threatened Species. Available At: <https://www.iucnredlist.org/>
- Ref 12-10** MMO landings statistics (2025). Available at: <https://www.gov.uk/government/collections/uk-sea-fisheries-annual-statistics>
- Ref 12-11** International Council for the Exploration of the Seas (ICES) data. Available at: <https://www.ices.dk/Pages/default.aspx>
- Ref 12-12** Environment Agency (2025). Transitional and Coastal Waters (TraC) Fish Monitoring. Available at: <https://www.data.gov.uk/dataset/b8aa438b-338a-4bb1-8ff1-9e904e1687fb/transitional-coastal-water-fish-surveys-nfpd>
- Ref 12-13** International Council for the Exploration of the Sea (ICES). Celtic Seas ecosystem overview. Available at: https://www.ices.dk/advice/ESD/Pages/Celtic_Seas_Landing.aspx
- Ref 12-14** Records of marine mammal sightings from the Cheshire Environmental Records Centre. Available at: <https://www.cheshire-biodiversity.org.uk/>
- Ref 12-15** National Biodiversity Network. Available at: <https://nbn.org.uk/>
- Ref 12-16** SCANS (Small Cetacean Abundance in the European Atlantic and North Sea) data. Available at: <https://scans3.wp.st-andrews.ac.uk/>
- Ref 12-17** Reid, et al. (2003) The Atlas of Cetacean distribution in north-west European waters. Available at: <https://data.jncc.gov.uk/data/a5a51895-50a1-4cd8-8f9d-8e2512345adf/atlas-cetacean-distribution-web.pdf>
- Ref 12-18** The Sea Watch Foundation marine mammal sightings distribution maps. Available at: <https://seawatchadmin.imardis.org/sightings-viewer>
- Ref 12-19** CIEEM (2024). CIEEM Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine.
- Ref 12-20** BGS Geology Viewer (2025). BGS Geology Map Viewer. Available at: <https://www.bgs.ac.uk/map-viewers/bgs-geology-viewer/>
- Ref 12-21** CEFAS (2016). Suspended Sediment Climatologies around the UK. Report for the UK Department for Business, Energy & Industrial Strategy offshore energy Strategic Environmental Assessment programme. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/584621/CEFAS_2016_Suspended_Sediment_Climatologies_around_the_UK.pdf
- Ref 12-22** UK Hydrographic Office (2016). Admiralty Tide Tables, NP201-208, Volume 1 [online]. Available at: <https://www.admiralty.co.uk/publications/publications-and-reference-guides/admiralty-tide-tables>
- Ref 12-23** ABPmer (2017). Renewables Atlas. Available at: <https://www.renewables-atlas.info/explore-the-atlas/>

- Ref 12-24** ABPmer (2018). Data Explorer (SEASTATES). Available at: <https://www.seastates.net/explore-data/>
- Ref 12-25** Halcrow (2010). North West England and North Wales Shoreline Management Plan SMP2. Supporting Studies. Cell Eleven Tide and Sediment Transport Study (CETaSS) Phase 2 (ii). Main Report – Summary of Findings. Report prepared by Halcrow Group Ltd for the North West and North Wales Coastal Group, 152pp.
- Ref 12-26** UKCP (2023). UK Climate Projections User Interface. Available at: <https://ukclimateprojections-ui.metoffice.gov.uk/ui/home>
- Ref 12-27** Department for Transport and Maritime and Coastguard Agency (2012). Ports & Marine Facilities Safety Code. Available at: <https://www.gov.uk/government/publications/port-marine-safety-code>
- Ref 12-28** The Chartered Institute for Archaeologists (2020). ClfA Standard and Guidance for historic environment Desk-Based Assessment. Available at: <https://cifa.hosted.york.ac.uk/sites/default/files/2023-11/ClfA-SandG-DBA-2020.pdf>
- Ref 12-29** Conservation Principles, Policies and Guidance for the Sustainable Management of the Historic Environment. Available at: <https://historicengland.org.uk/advice/constructive-conservation/conservation-principles>
- Ref 12-30** HM Government (2009). Our Seas – a shared resource: High level marine objectives. Available at: <https://www.gov.uk/government/publications/our-seas-a-shared-resource-high-level-marine-objectives>
- Ref 12-31** Joint Nautical Archaeology Policy Committee (JNAPC) (2006). JNAPC Code of Practice for Seabed Development. Available at: https://www.historicenvironment.scot/media/2374/jnapc_brochure_may_2006.pdf
- Ref 12-32** Historic England (2008). Conservation Principles, Policies and Guidance for the Sustainable Management of the Historic Environment. Available at: <https://historicengland.org.uk/images-books/publications/conservation-principles-sustainable-management-historic-environment/>
- Ref 12-33** Historic England (2017). Ships and Boats: Prehistory to Present: Designation Selection Guide. Available at: <https://historicengland.org.uk/images-books/publications/dsg-ships-boats/>

13. Geology and Ground Conditions

13.1 Introduction

- 13.1.1 This chapter presents an initial baseline for geology and ground conditions, an overview of the assessment methodology to be followed for the environmental assessment and identifies the potential effects of the Proposed Development.
- 13.1.2 This chapter describes the following:
- data collation which will be followed to determine the existing ground conditions with respect to geology and ground conditions,
 - the identified Study Area,
 - the assessment method which will be adopted to identify possible effects posed by the existing geology and ground conditions; and
 - the identification of effects of the Proposed Development, and how the significance of effects will be determined.
- 13.1.3 This chapter also identifies the effects which are unlikely to be significant and are therefore proposed to be 'scoped out' of the remaining EIA process.

13.2 Legislation, Policy and Guidance

- 13.2.1 A brief overview of the policy, legislation and guidance relevant to the geology and ground conditions assessment have been reviewed and summarised in the Tables 13-1 to 13-3.

Table 13-1: European and National Legislation

Legislation
European
The Water Framework Directive (2000/60/EC) (Ref 13-1)
The Groundwater Directive (2006/118/EC) (Ref 13-2)
The Environmental Liability Directive (2004/35/EC) (2004) (Ref 13-3)
Classification Labelling & Packaging (CLP) Regulation (2008/1272/EC) (Ref 13-4)
The Priority Substances Directive (2008/105/EC) (Ref 13-5)
National
Environmental Protection Act, 1990 (Ref 13-6)
The Environment Act, 1995, 2021 (Ref 13-7)
The Water Act 2003, 2014 (Ref 13-8)
The Water Resources Act 1991 (Ref 13-9)
The Land Drainage Act 1991 (Ref 13-10)
Cheshire Brine Pumping (Compensation for Subsidence) Act 1952 (Ref 13-11)
The Anti-Pollution Works Regulations 1999, SI 1999/1006 (Ref 13-12)
Groundwater (England and Wales) Regulations, 2009 SI 2009/2902 (Ref 13-13)

Legislation
The Waste (England and Wales) Regulations 2011, SI 2011/988 (Ref 13-14)
The Contaminated Land (England) Regulations, 2012 SI 2012/1380 (Ref 13-15)
Environmental Damage (Prevention and Remediation) (England) Regulations, 2015 SI 2015/810 (Ref 13-16)
The Environmental Permitting (England and Wales) Regulations 2016 SI 2016/1154 (Ref 13-17)
The Water Environment (Water Framework Directive) Regulations 2017 SI 2017/407 (Ref 13-18)

Table 13-2: National Planning Policy

National Planning Policy
Overarching National Policy Statement for Energy (EN-1) (2025) (Ref 13-19)
National Policy Statement for Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4) (2023) (Ref 13-20)
National Planning Policy Framework (2025) (Ref 13-21)
Planning Practice Guidance (2019) (Ref 13-22)
A Green Future: Our 25 Year Plan to Improve the Environment (Ref 13-23)
Environmental Improvement Plan 2023 (Ref 13-24)

Table 13-3: Relevant Standards and Guidance

Relevant Standards and Guidance
DMRB LA109 Geology and Soils (National Highways, 2019a) (Ref 13-25)
DMRB LA113 Road Drainage and the Water Environment (National Highways, 2020) (Ref 13-26)
DMRB LA 104 Environmental Assessment and Monitoring (National Highways, 2020) (Ref 13-27)
Land Contamination Risk Management (EA, 2025) (Ref 13-28)
A New Perspective on Land and Soil in Environmental Impact Assessment (Institute of Environmental Management and Assessment, 2022) (Ref 13-29)

13.3 Defining the Study Area

- 13.3.1 In general, the Study Area for geology and ground conditions have been identified within the Scoping Boundary or within approximately 250 m of the Scoping Boundary, as interaction between the Proposed Development and receptors, or sources of contamination beyond 250 m would generally not occur as a result of the ground conditions present in and around the Proposed Development. For geology this is limited to the area within the Scoping Boundary. For assessment of effects to controlled waters, designated sites, groundwater abstractions and groundwater source protection zones (SPZs), a buffer extending 1 km from the Scoping Boundary is considered appropriate.

13.3.2 These Study Areas are considered to be appropriate for the assessment of geology and ground conditions in accordance with methodology set out in the Design Manual for Roads and Bridges (DMRB) LA109 Geology and Soils (Ref 13-25). The Study Area distance has been used to identify potential receptors such as designated sites as well as identifying sources such as landfills. The Study Areas are also based on professional judgement by competent experts with relevant and appropriate experience of assessing land contamination and contamination dispersion.

13.4 Baseline Environment

13.4.1 For the purpose of the baseline environment section, the Proposed Development has been grouped into the following components:

- Breedon Capture Facility;
- Tarmac Capture Facility;
- Buxton Lime Capture Facility;
- Holcim Capture Facility;
- Peak Cluster Pipeline, split East (from operator sites up to Central Feeder AGI); Central (Between Central AGI Feeder and Connection AGI 2, near Ellesmere Port); and West (from Connection AGI 2 to the Coastal AGI); and
- Coastal AGI to MLWS Pipeline(s), including the Coastal AGI.

13.4.2 The baseline environment data for the above components has been included within Table 13-5 to Table 13-10.

13.4.3 For ecological receptors please refer to Figure 1-4 Key Environmental Constraints and Chapter 6 Biodiversity. For further information on surface water receptors, please refer to Chapter 11 Water Environment and Flood Risk.

Table 13-4: Geology and Ground Conditions Baseline Environment – Breedon Capture Facility

Breedon Capture Facility
Geology
Artificial Deposits – None recorded. However, due to the nature of the Capture Facility, Made Ground is anticipated. Superficial Deposits – The east is occupied by Head deposits comprising sand, silt, clay and gravel. Alluvium is recorded along the alignment of the Peakshole Water which crosses the subsite. River Terrace Deposits are recorded along River Noe which extends towards northwards crossing over the far north of the subsite. To the west of plant infrastructure, no superficial deposits are noted. Bedrock Geology –To the east, the Bowland Shale Formation (mudstone, siltstone and sandstone) is recorded. West of this, beyond the extent of the plant infrastructure the Bee Low Limestones Formation is recorded. Further west is the Monsal Dale Limestone Formation is present. The Litton Tuff Member is recorded in isolated areas within the Scoping Boundary extent. A total of eight available BGS boreholes were recorded onsite and a further borehole within 250 m of the Scoping Boundary. Of this, only three onsite had the available geology, which has been detailed below along with the offsite borehole:

Breedon Capture Facility

SK18SE66 – Onsite (central)

- Clays to 0.50 m bgl, Limestone to 12 m bgl, Limestone with clay beds to 35 m bgl, Limestone to 132 m bgl, blue gritty shales to 132.5 m bgl, Limestone to 159 m bgl, Limestone with clays to 167.5 m bgl. Groundwater strike at 143 m bgl.

SK18SE31 – Onsite (north)

- Sandy soil to 0.28 m bgl, interbedded Sandstone, Siltstone and Mudstone to 48.79 m bgl. No groundwater data available.

SK18SE33 – Onsite (north)

- Clay to 1.52 m bgl, interbedded Sandstone, Siltstone and Mudstone to 48.77 m bgl. No groundwater data available.

SK18SE6 – 210 m north-east

- Interbedded mudstone, sandstone and siltstone with bands of shale to 94.72 m bgl. No groundwater data available.

The quarry onsite associated with the Hope cement plant is not listed as a LGS or RIGS. The nearest LGS is related to Hadfields Quarry approximately 1 km south-west of the site (SK 1610 8242).

Hydrogeology

Superficial Deposits – Head Deposits: Secondary Undifferentiated Aquifer

Superficial Deposits – Alluvium and River Terrace Deposits: Secondary A Aquifer

Bedrock - Bowland Shale Formation: Secondary A Aquifer

Bedrock – Monsal Dale Formation: Principal Aquifer

All aquifer definitions are within Table 13-5 and Table 13-6.

No SPZs are present within 1 km of the Scoping Boundary.

Hydrology

The River Noe and Peakshole Water meander across the northern extent of the Hope Scoping Boundary. Bradwell Brook is also noted from 120 m east of Scoping Boundary. Numerous small to large surface water features are noted onsite north-east of the railway sidings appearing to be manmade features, as well as drainage channels labelled. To the south-west of the railway sidings a few smaller ponds are present.

The Hope Scoping Boundary lies within 3 No. catchment areas:

- Noe from Peakshole Water to Derwent water body: Moderate Ecological rating (2022) and a Fail Chemical rating (as of 2019). Reasons for not achieving Good was due to the presence of Polybrominated diphenyl ethers (PBDE) and calcium above reasonable concentrations.
- Peakshole water catchment (tributary of Noe) water body: Moderate Ecological rating (2022) and a Fail Chemical rating (as of 2019). Reasons for not achieving Good was due to the presence of Polybrominated diphenyl ethers (PBDE) above reasonable concentrations.
- Noe from source to Peakshole Water water body: Good Ecological rating (2022) and a Fail Chemical rating (as of 2019). Reasons for not achieving Good was due to the presence of Polybrominated diphenyl ethers (PBDE) and phosphate above reasonable concentrations.

Agricultural Land Classification

The Majority of the Scoping Boundary is within an ALC Grade 4 as well as the linear extent north of Castleton Road. The ALC Grades 3 (covering approximately 10.06 ha of land) and 5 are noted to the west within the Scoping Boundary.

Breedon Capture Facility

Coal Mining and Quarries

The Hope Scoping Boundary is outside of the Coal Mining Reporting Area.

There are 27 No. quarries onsite within the Hope Scoping Boundary, with a further 3 No. within 250 m. The status of these were predominantly ceased or inactive, with 1 No. active for Hope Limestone Quarries located centrally.

There are three mineral sites noted onsite for the following – Bradwell Moor for Fluorspar and Smalldale Pipe and Moss Rake for Lead.

Historical and Current Landfills

There is one permitted landfill present onsite to the north (Breedon Cement, industrial waste landfill), and three historical landfills onsite (one to the north (Hope Works) and two to the south (Potter Barn and Moss Rake). No further landfills (current or historical) noted within 250 m of the Scoping Boundary.

UXO Potential

Online Zetica UXO risk mapping shows a Low risk (15 bombs per 1,000 acres or less) for the Hope Scoping Boundary.

Current and Historical Potential Contaminative Land Uses

Potentially contaminative sources include:

- Onsite current (1 No.) and historical (3 No.) landfills
- Onsite Hope Cement Works (contaminants relating to processes and construction)
- Onsite electricity substation
- Onsite above ground storage tanks
- Onsite rail sidings
- Onsite and offsite Made Ground (anticipated due to Carbon Capture Facility and access roads, not recorded)
- Onsite and offsite infilled land (relating to infilled ceased quarries and/or ponds)

Ground Gas

Potential for ground gas relating to the infilled land on/offsite, historical landfills onsite and potential Made Ground associated with the construction of the works and access roads

Baseline Data Sources

BGS 1:50,000 Mapping Drift, Sheet 99 for Chapel en le Frith (1977)

BGS 1:50,000 Mapping Solid, Sheet 99 for Chapel en le Frith (1987)

Derbyshire Wildlife Trust - Hadfields Quarry | Derbyshire Wildlife Trust

Refer to Chapter 13.9 for all reoccurring references.

Sensitive Receptors

Human Health

- Construction and/or maintenance workers onsite including both current maintenance workers at the cement plant and future workers for the capture facility, as well as workers involved during the construction phases.
- Site users including staff at the facility and site visitors.
- Adjacent site users including farm owners and users of the surrounding agricultural fields.

Controlled Waters

Breedon Capture Facility

- Presence of a Secondary Undifferentiated and Secondary A Aquifer associated with the superficial deposits and Secondary A and Principal Aquifers associated with the bedrock geology within the Scoping Boundary.
- Peakshole Water and the River Noe located onsite, with numerous natural and manmade ponds onsite. Drains are noted across the surrounding fields within the Scoping Boundary.

Built Environment

- Presence of the Hope Cement facility onsite, and associated infrastructure.

Sensitive Land Uses

- The subsite is located within the confines of the Peak District National Park. Special Areas of Interest are also noted to extend along the western boundary of the subsite, extending westwards.

Agricultural Soils

Grade 3 ALC noted onsite to the west, covering approximately 10.06 ha of land.

Future Baseline

The Proposed Development is situated within the current Hope Cement Plant and surrounding land. Although there is a potential for the baseline presented in this chapter to change overtime; it is considered that the data presented provides a good representation of the land use and geological and hydrogeological conditions at this stage of the Proposed Development; and thus, the baseline presently provides a realistic platform upon which to base any impact assessment work.

Table 13-5: Geology and Ground Conditions Baseline Environment – Tarmac and Buxton Lime Capture Facility

Tarmac and Buxton Lime Capture Facility

Geology

Artificial Deposits – None recorded, however, due to the nature of the Capture Facilities, Made Ground is anticipated.

Superficial Deposits – There is predominantly no superficial deposits present within the Scoping Boundary. Alluvium deposits extend along the eastern side of the Scoping Boundaries aligned with the railway comprising sand, silt, clay and gravel.

Bedrock Geology – Predominantly comprised of the Bee Low Limestone Formation, with the Lower Miller's Dale Lava Member and an unknown igneous intrusion (microgabbro) outcropping across the north onsite.

A total of 25 No. BGS available boreholes were recorded onsite and a further 12 No. within 250 m of the Scoping Boundary. The four most recent (1954 onsite and 1980 offsite) are detailed as follows:

SK07SE44 – Onsite (north)

- Topsoil to 0.45 m bgl, white-grey (assumed limestone) to 12.34 m bgl, white-light grey to white (assumed limestone) with clay intrusions to 108.51 m bgl, grey dark-grey to black-dark grey (assumed mudstone or dark limestone) to 113.15 m bgl. No groundwater data provided.

SK07SE29 – Onsite (central-south)

- Clay Topsoil to 0.70 m bgl, light grey with clay joints (assumed limestone) to 48.70 m bgl, grey to dark grey shaly Limestone to 55.50 m bgl, crystalline dolomite to 56.75m bgl, grey mudstone with interbedded light grey (assumed limestone) to 64.92 m bgl, sandy dolomite and dark grey (assumed mudstone or dark limestone) to 78.79 m bgl, black laminated limestone to 87.40 m bgl, brown dolomitic and dark grey assumed mudstone or dark limestone) to 82.60 m bgl.

SK17SW77 – 30 m east

Tarmac and Buxton Lime Capture Facility

- Topsoil to 0.40 m bgl, Weathered Lava to 7.15 m bgl, Tuff to 8.50 m bgl, Limestone to 11.10 m bgl. Shale to 34.93 m bgl, interbedded Limestone and Shale to 84.73 m bgl. Groundwater strikes at 6.90 m and 8.30 m bgl.
SK17SW76 – 120 m east
- Topsoil to 0.40 m bgl, Clay with sand to 0.80 m bgl, Limestone boulders to 2.50 m bgl, sand and gravel to 2.70 m bgl, weathered lava to 4.15 m bgl, pyritic Tuff to 8.10 m bgl, Limestone to 11.81 m bgl. Groundwater strikes at 3.30 m bgl, 3.90 m bgl and 6.20 m bgl.

Hydrogeology

Superficial Deposits - Alluvium: Secondary A Aquifer (permeable layers that can support local water supplies and may form an important source of base flow to rivers)

Bedrock - Beeston Low Limestone Formation: Principal Aquifer (provide significant quantities of drinking water and water for business needs. They also support rivers, lakes and wetlands).

No SPZs are present within the Scoping Boundary, a SPZ1 is noted from 80 m north-east of the Capture Facilities Scoping Boundary.

Hydrology

Eight surface water bodies are noted onsite— all appear to be manmade due to either their precise circular nature or proximity to the plant facilities. A small linear feature is also noted to the north appearing to be drainage. A further three surface water features are noted from directly east of the Scoping Boundary to 220 m east – all likely small natural ponds. The nearest main river is the Wye Dale c. 1.15 km south of the Scoping Boundary. The Wye from source to Monks Dale water body (ID: GB104028058460) a Good Ecological rating (as of 2022) and Fail chemical rating (as of 2019) was given. Reasons for not achieving Good was due to the presence of benzo(g-h-i)perylene, Polybrominated diphenyl ethers (PBDE) and Perfluorooctane sulphonate (PFOS) above reasonable concentrations.

Agricultural Land Classification

The majority of the Scoping Boundary lies within ALC Grade 5, with the western edge and north-western corner within Grade 4.

Coal Mining and Quarries

The Scoping Boundary in this area is outside of the Coal Mining Reporting Area.

There are thirteen quarries onsite within the Tarmac and Buxton Lime Scoping Boundaries, with a further six within 250 m. These were all ceased or inactive, except for Tunstead Quarry located to the south.

Historical and Current Landfills

A historical landfill is noted onsite at Tarmac and Buxton Lime across the north. No further landfills (current or historical) noted within 250 m of the Scoping Boundary.

UXO Potential

Online Zetica Unexploded Ordnance (UXO) risk mapping shows a Low risk (15 bombs per 1,000 acres or less) for the Tarmac and Buxton Lime Scoping Boundary.

Current and Historical Potential Contaminative Land Uses

Potentially contaminative sources include:

Onsite historical landfill

Onsite Tarmac and Buxton Lime Works (contaminants relating to processes and construction including the Lime Kilns)

Onsite rail sidings

Tarmac and Buxton Lime Capture Facility

Onsite and offsite Made Ground (anticipated due to Carbon Capture Facilities and access roads, not recorded)

Onsite and offsite infilled land (relating to infilled ceased quarries and/or ponds)

Onsite and offsite Works of unknown use – South Lime Works onsite and Longsiding Works 175 m north-east (identified during the quarry search)

Ground Gas

Potential for ground gas relating to the infilled land on/offsite, historical landfill onsite and potential Made Ground associated with the construction of the Capture Facilities and access roads.

The quarry associated with the Tarmac and Buxton Lime plants is not listed as a Local Geological Site (LGS) or Regionally Important Geological Site (RIGS). The nearest LGS is associated with the Grin Low Quarry approximately 2 km south-west of the village of Tunstead.

Baseline Data Sources

BGS 1:50,000 Mapping Solid and Drift, Sheets 111 for Buxton, 1978

Derbyshire County Council – Ecology, geology and biodiversity - Derbyshire County Council

Refer to Chapter 13.9 for all reoccurring references.

Sensitive Receptors

Human Health

- Construction and/or maintenance workers onsite including both current workers at the cement/lime plants and future workers at the carbon capture facilities, as well as workers involved in the construction phases.
- Site users including staff at the facilities and site visitors.
- Adjacent site users including users of the surrounding agricultural fields.

Controlled Waters

- Presence of a Secondary A associated with the superficial deposits and Principal Aquifers associated with the bedrock geology within the Scoping Boundary.
SPZ1 noted from 80 m north-east
- There are 11 No. surface water features noted onsite and within 250 m of the Tunstead and Buxton CCP extents. Potential for land drains across the surrounding fields within 250 m of the scoping boundary.

Built Environment

Presence of the Tarmac and Buxton Lime facilities onsite, and all associated infrastructure.

Potential for agricultural uses on the land surrounding site, including the use for fields for crops and livestock.

Sensitive Land Uses

Special Area of Conservation noted 215 m south-west of the Tarmac and Buxton Lime scoping boundary and the Peak District National Park noted from 120 m south-east, wrapping around to the east.

Future Baseline

The Proposed Development is situated within the current Tarmac and Buxton Lime and surrounding land. Although there is a potential for the baseline presented in this chapter to change overtime; it is considered that the data presented provides a good representation of the land use and geological and hydrogeological conditions at this stage of the Proposed Development; and thus, the baseline presented provides a realistic platform upon which to base any impact assessment work

Table 13-6: Geology and Ground Conditions Baseline Environment – Holcim Capture Facility

Holcim Capture Facility
Geology
Artificial Deposits – Made Ground (Undivided) is noted in the western extents of the scoping boundary. Made Ground is anticipated due to the nature of the Capture Facility. Superficial Deposits – There is predominantly no superficial deposits present within the scoping boundary. Head deposits encroach onto the Scoping Boundary of the Carbon Capture Facility to the east comprising sand, silt, clay and gravel and Till deposits to the west of unknown composition. Bedrock Geology – To the far north, the Bowland Shale Formation (mudstone, siltstone and sandstone) outcrops in the vicinity of Earlsway road. South of this across the majority of the facility Widmerpool Formation (interbedded limestone and mudstone) is recorded. South of this, the Hopedale Limestone Formation is recorded extending across the south of the facility towards the quarry. Along the southern boundary of the Holcim subsite the Milldale Limestone Formation is recorded. It is anticipated that the bedrock geologies all extend beneath the site with Bowland Shale highest in stratigraphy to the Milldale Limestone at the lowest. Three BGS boreholes were present within 250 m of the Scoping Boundary, detailed as follows: <u>SK04NE4/B – Onsite</u> – Soil and Clay to 0.30 m bgl, Shale to 1.50 m bgl, Clay to 2.10 m, Shale to 28.00 m bgl. Groundwater strike at 9.10 – 10.70 m bgl. <u>SK04NE4/A – 160 m north</u> – Soil to 0.15 m bgl, Shal to 1.07 m bgl, Clay to 3.51 m bgl, Clay with shale to 5.03 m bgl smut to 10.36 m bgl, shale to 48.77 m bgl. Groundwater strike at 2.54 – 3.51 m bgl. <u>SK05SE18 – 220 m north</u> – Soil to 0.60 m bgl, Clay to 1.22 m bgl, Shale to 34.93 m bgl, interbedded Limestone and Shale to 84.73 m bgl. No groundwater encountered. The quarry associated with the Holcim plant is not listed as a LGS or RIGS. There are no LGS listed on the Staffordshire Ecological records, with the closest site a Geological Conservation Review (GCR) site approximately 400 m east associated with the Cauldon Low Quarry (SK 077 491).
Hydrogeology
Superficial Deposits – Head and Till Deposits: Secondary Undifferentiated (aquifers where it is not possible to apply either a Secondary A or B definition because of the variable characteristics of the unit type) Bedrock Geology - Bowland Shale Formation and Widmerpool Formation: Secondary A Aquifer. Bedrock Geology - Hopedale Limestone Formation and Milldale Limestone Formation: Principal Aquifer Descriptions of Secondary A and Principal Aquifers are given in Table 13-4. No SPZs are present within 1 km of the Scoping Boundary.
Hydrology
Four surface water bodies (potentially manmade) are noted onsite within the Holcim Scoping Boundary– One to the east associated with the Middlehills Farm and three west of the facility. There are a number offsite, including the large Lafarge Cement Cauldon Shale Lake 200 m north-west. The River Hamps is noted 310 m north of the Holcim Scoping Boundary. For Hamps from Source to R Manifold Water body (ID: GB104028052900) a Good Ecological rating and Fail chemical rating (as of 2019) was given. Reasons for not achieving Good was due to the presence of Macrophytes and Phytobenthos, Polybrominated diphenyl ethers (PBDE) and Mercury above reasonable concentrations.

Holcim Capture Facility

Agricultural Land Classification

The majority of the Scoping Boundary lies within an ALC Grade 4, with the far east within an area of Grade 5.

Coal Mining and Quarries

The Scoping Boundary is outside of the Coal Mining Reporting Area.

The Holcim quarry (ceased) is directly south-east of the Cauldon Scoping Boundary. No other quarries are noted within 250 m of the Scoping Boundary.

Historical and Current Landfills

Historical landfill noted onsite of Holcim, extending offsite to the north. No further landfills (current or historical) noted within 250 m of the Scoping Boundary.

UXO Potential

Online Zetica UXO risk mapping shows a Low risk (15 bombs per 1,000 acres or less) for the Cauldon Scoping Boundary.

Current and Historical Potential Contaminative Land Uses

Potentially contaminative sources include:

- Onsite historical landfill
- Onsite Holcim Cement Works (contaminants relating to processes and construction)
- Onsite electricity substation
- Onsite and offsite Made Ground (anticipated due to Capture Facility and access roads, not recorded)

Ground Gas

Potential for ground gas relating to the historical landfill onsite and potential Made Ground associated with the construction of the Capture Facility and access roads.

Baseline Data Sources

BGS 1:50,000 Mapping Solid with Drift, Sheet 124 for Ashbourne (1983)

Holcim Cauldon Cement Plant – Cauldon Cement Plant

Staffordshire Ecological Record – Staffordshire Ecological Record

Refer to Chapter 13.9 for all reoccurring references.

Sensitive Receptors

Human Health

- Construction and/or maintenance workers onsite including both current maintenance workers at the cement plant and future workers for the carbon capture facility, as well as workers involved during the construction phases.
- Site users including staff at the facility and site visitors.
- Adjacent site users including residents of the small village of Cauldon to the west, occupants of Middlehills Farm to the east and users of the surrounding agricultural fields.

Controlled Waters

- Presence of a Secondary Undifferentiated Aquifer associated with the superficial deposits, and Secondary A and Principal Aquifers associated with the bedrock geology within the Scoping Boundary.

Holcim Capture Facility

- River Hamps noted <250 m north of the site. There are four surface water features noted onsite of the Cauldon site. Potential for land drains across the surrounding fields within 250 m of the Scoping Boundary.

Built Environment

- Presence of the Holcim Cement facility onsite, including associated infrastructure.

Sensitives Land Uses

No known environmental designations present within 250 m of the Holcim Scoping Boundary. Closest is the Peak District National Park noted from 320 m north.

Future Baseline

The Proposed Development is situated within the current Holcim Cement Plant and surrounding land. Although there is a potential for the baseline presented in this chapter to change overtime; it is considered that the data presented provides a good representation of the land use and geological and hydrogeological conditions at this stage of the Proposed Development; and thus, the baseline presented provides a realistic platform upon which to base any impact assessment work.

Table 13-7: Geology and Ground Conditions Baseline Environment – Peak Cluster Pipeline (East)

Peak Cluster Pipeline (East Section)

Geology

Artificial Ground - None recorded. However, Made Ground is anticipated.

Superficial Deposits – Superficial deposits across the Pipeline East vary between Alluvium, Head, Glacial Till, Glaciofluvial and River Terrace deposits with vast areas unoccupied by drift deposits. To the far east in the vicinity of the Hope CCP it is relatively unoccupied by superficial deposits with Alluvium and Head deposits recorded in isolated areas. Glacial Till, Glaciofluvial and Alluvium deposits are noted around Chapel-en-le-Frith, increasing in presence in the vicinity of Bollington and Macclesfield. Alluvium and River Terrace deposits are generally aligned to watercourses present along the extent. South of Chapel-en-le-Frith the area is predominantly absent of superficial deposits with patches of Head deposits noted.

Bedrock Geology – The following geologies have been listed from east (Breedon Capture Facility) to west (Central Feeder AGI). Due to the high-level nature of this document and the number of bedrock geologies noted a full comprehensive list of all members within each formation has not been included. In the vicinity of the Hope Capture Facility the Monsal Sale Limestone dominates, becoming the Bee Low Limestone Formation with igneous intrusions towards Tideswell Moor. In the Chapel-en-le-Frith area the Bowland Shale Grit, Shale Grit, Millstone Grit and Kinderscout Grit are recorded, along with interbedded beds of the Roaches Grit and the Chatsworth Grit. Beyond this in the Whaley Bridge area numerous geologies are noted including the Rough Rock Formation, Pennine Lower Coal Measures (PLCM), Woodhead Hill Rock, Chatsworth Grit, Millstone Grit, Milnrow Sandstone, Old Lawrence Rock, Roaches Grit and Kinderscout Grit. Towards Bollington the Chester Formation, Old Lawrence Rock and PLCM are recorded, which becomes the Chester Formation, Helsby Sandstone Formation and Wilmslow Sandstone Formation north of Prestbury. To the west of Macclesfield, the Tarporley Siltstone Formation, Wilmslow Formation, Helsby Formation and the Bollin Mudstone Member are present beneath the site. South of Chapel-en-le-Frith towards the Tarmac & Buxton Lime facility beyond the Shale Grit and Millstone Grit, the bedrock geology recorded is predominantly the Bee Low Limestone Formation with igneous intrusions.

Peak Cluster Pipeline (East Section)

Due to the linear extent of the Pipeline, no BGS boreholes or LGS/RIGS records have been reviewed at this stage.

Hydrogeology

Superficial Deposits – Head Deposits: Secondary Undifferentiated

Superficial Deposits – Alluvium and River Terrace Deposits: Secondary A Aquifer

Bedrock – Monsal Sale Limestone, Shale Grit, Millstone Grit, Kinderscout Grit, Roaches Grit, Chatsworth Grit, Rough Rock Formation, PLCM, Woodhead Hill Rock, Milnrow Sandstone and Old Lawrence Rock – Secondary A Aquifers

Bedrock – Bee Low Limestone Formation, Chester Formation and Wilmslow Sandstone Formation: Principal Aquifer

All aquifer definitions are provided within Table 13-4 and 13-5.

There are SPZs present within 1 km of the Scoping Boundary. A SPZ1 is noted 950 m east of the pipeline which extends towards Tunstead CCP. A SPZ3 is recorded 400 m south-west of the pipeline between Chapel-en-le-Frith and Whaley Bridge and extends across the Scoping Boundary west of the Bollington and Macclesfield area. All SPZ2s and SPZ1s associated with these are >1 km.

Hydrology

Along the extent of the Pipeline East there are a number of watercourses, these have been listed from east to west – Warm Brook (Chapel-en-le-Frith), tributaries of Randal Carr Brook including Tunstead Milton Brook, Peak Forest Canal and River Goyt (Whaley Bridge), Ringstone Clough, Bowside Clough, Bollinghurst Brook, Todd Brook, Ramsclough Brook, Whiteley Green Brook, River Dean, River Bollin, the Macclesfield Canal, Collar House Brook and Harebarrow Brook and Bartons Clough, as well as various tributaries of these and drainage channels. A number of reservoirs and ponds are also noted onsite and within 250 m of the Scoping Boundary.

Due to the extent of the pipeline, the catchment areas have not been listed at this stage.

Agricultural Land Classification

The ALC grades vary across the extent of the Pipeline East, with the majority of the Scoping Boundary within ALC Grades 4 and 5. Areas of the extent are noted as Grade 3, particularly west of Bollington to the north of Prestbury, and down towards the Central Feeder AGI.

Coal Mining and Quarries

The Pipeline East extends through a Coal Mining Reporting Area between Tunstead Milton (west of Chapel-en-le-Frith) and Macclesfield. Within this extent the following features were noted as present on or within 250 m of the scoping boundary – Development High Risk Area (DHRAs) associated with mine entries, probable shallow workings, past shallow workings, underground workings and coal outcrops.

There are >50 No. quarries noted onsite, with more recorded within 250 m of the pipeline. Due to the extent of the pipeline and number of quarries recorded these have not been listed at this stage. They are mostly ceased with a limited number noted as inactive.

Historical and Current Landfills

There is one historical landfill onsite in the Whaley Bridge area, with a further seven historical landfills within 250 m of the Scoping Boundary. No further landfills (current or historical) noted within 250 m of the Scoping Boundary.

Peak Cluster Pipeline (East Section)

UXO Potential

Online Zetica UXO risk mapping shows a Low risk (15 bombs per 1,000 acres or less) for the Eastern Pipeline.

Current and Historical Potential Contaminative Land Uses

Potentially contaminative sources include:

- Onsite and offsite historical landfills
- Onsite and offsite railway land
- Onsite and offsite Made Ground (anticipated not recorded) – A6, A523 and A537 highways and residential towns/villages,
- Onsite and offsite infilled land (relating to infilled ceased quarries and/or ponds)
- Offsite Hope and Tarmac and Buxton Lime
- Offsite petrol filling stations

Ground Gas and Mine Gas

Potential for ground gas relating to the on/offsite infilled land, historical landfills and potential Made Ground. The Pipeline is also located within a Coal Mining Reporting Area with parts within DHRAs due to the presence of mine entries, coal mine workings and coal outcrops. The potential for mine gas on site is present where exposure pathways are present such as boreholes, fractures/fissures, permeable strata and/or mine entries.

Baseline Data Sources

BGS 1:50,000 Mapping Drift, Sheet 99 for Chapel en le Frith (1977) and Sheet 111 for Buxton (1978)
 BGS 1:63,360 Mapping Drift, Sheet 110 for Macclesfield (1968)
 BGS 1:50,000 Mapping Solid, Sheet 99 for Chapel en le Frith (1987), Sheet 110 for Macclesfield (1997) and Sheet 111 Buxton (1978)
 Refer to Chapter 13.9 for all reoccurring references

Sensitive Receptors

Human Health

- Construction and/or maintenance workers onsite for the pipeline and AGI Feeders.
- Site users and visitors including the general public and residents.
- Adjacent site users including residents, the general public and users of the surrounding agricultural fields.

Controlled Waters

- Presence of a Secondary Undifferentiated and Secondary A Aquifer associated with the superficial deposits and Secondary A and Principal Aquifers associated with the bedrock geology within the Scoping Boundary.
- A SPZ1 is noted within 950 m of the Scoping Boundary with a SPZ3 within 400 m (no associated SPZ2s or SPZ1s are within 1 km).
- Various watercourses and drainage channels noted onsite and within 250 m of the Scoping Boundary as listed above.

Built Environment

- Presence of residential, commercial and industrial properties within 250 m of the Scoping Boundary.

Sensitive Land Uses

Peak Cluster Pipeline (East Section)

- The pipeline is located within the confines of the Peak District National Park at various points. Special Areas of Interest are also noted to extend along the western boundary of the subsite, extending westwards.

Agricultural Soils

Grade 3 ALC noted onsite to the west in the Macclesfield area.

Future Baseline

The Proposed Development is situated across land occupied by agricultural fields and residential, commercial and industrial properties. Although there is a potential for the baseline presented in this chapter to change overtime; it is considered that the data presented provides a good representation of the land use and geological and hydrogeological conditions at this stage of the Proposed Development; and thus, the baseline presented provides a realistic platform upon which to base any impact assessment work.

Table 13-8: Geology and Ground Conditions Baseline Information – Peak Cluster Pipeline (Central)

Peak Cluster Pipeline (Central Section)

Geology

Artificial Deposits - None recorded. However, Made Ground is anticipated.

Superficial Deposits – The Central Pipeline extends between the Central Feeder AGI (west of Macclesfield) towards the west to Ellesmere Port, approximately 60 km in distance between the two points. The pipeline siphons off to the south at the Central Feeder AGI joining to Cauldon Carbon Capture Facility across approximately 40 km. Superficial deposits across this area predominantly Glacial Till and Glaciofluvial deposits, with isolated areas of Peat and River Terrace Deposits and Alluvium aligned along watercourses. Beyond Middlewich to the west, the predominantly deposit is Till with the remaining deposits seen with limited extent. Towards the south where Cauldon Carbon Capture Facility joins to the pipeline, the superficial deposits identified typically consist of Glacial Till and Glaciofluvial deposits with Head and Peat noted in isolated areas, and Alluvium and River Terrace Deposits aligned to the watercourses crossing the Scoping Boundary.

Bedrock Geology – The following geologies have been listed from east (Central Feeder AGI) to west (Ellesmere Port). Due to the high-level nature of this document and the number of bedrock geologies noted a full comprehensive list of all members within each formation has not been included. In the vicinity of the Central Feeder AGI the Helsby Sandstone Formation, Tarporley Siltstone Formation and Bollin Mudstone Member beyond are recorded. The Northwich Halite Member outcrops with the Bollin Mudstone north of Marton. West of Martson the Sidmouth Mudstone Formation is recorded, the Wilkesley Halite Member and Northwich Halite Members are present outcropping within the Sidmouth mudstone around Middlewich, an again at Calvely. Past Beeston-Brook the Bollin Mudstone, followed by the Tarporley Siltstone Formation, Wilmslow Sandstone Formation and then the Chester Formation are recorded up to Ellesmere Port. South of the Central Feeder AGI towards the Cauldon Carbon Capture Facility the bedrock geology encountered includes the Morridge Formation, Tarporley Siltstone Formation, Millstone Grit, Roaches Grit, Chester Formation, Bowland Shale Formation and Widmerpool Formation.

Due to the linear extent of the Pipeline, no BGS boreholes or LGS/RIGS records have been reviewed at this stage

Hydrogeology

Superficial Deposits – Glacial Till: Secondary Undifferentiated

Peak Cluster Pipeline (Central Section)

Superficial Deposits – Glaciofluvial, Alluvium and River Terrace Deposits: Secondary A Aquifers
Bedrock –Tarporely Siltstone Formation, Bollin Mudstone Member, Northwich Halite Member, Sidmouth Mudstone Formation, Wilkesley Halite Member, Wilmslow Sandstone Formation, Morridge Formation, Millstone Grit, Roaches Grit, Bowland Shale Formation and Widmerpool Formation: Secondary B Aquifer (predominantly lower permeability layers which may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers.)

Bedrock - Helsby Sandstone Formation and Chester Formation: Principal Aquifers (Where the halite members outcrop, no aquifer is noted)

All other aquifer definitions are provided within Table 13-4 and Table 13-5.

Three Source Protection Zone (SPZ) 3s extend across the Scoping Boundary for the pipeline heading south towards the Cauldon Carbon Capture Facility. Of these 3 all have a SPZ2 within 1 km of the boundary. Two SPZ1s are noted as close at 80 m south-west of the Scoping Boundary north of Leek. are present within 1 km of the Scoping Boundary. Another two SPZ3s extends across the Scoping Boundary in the vicinity of Beeston-Brook and north-east of Chester. The SPZ1s for these are > 1km from the Scoping Boundary.

Hydrology

Along the extent of the Central Pipeline there are a number of watercourses, these have been listed from east to west – Snape Brook, Morton Brook, River Dane, Sandersons Brook, Trent and Mersey Canal, Wheelock River, River Weaver, Crowton Brook, River Gow, Shropshire Union Canal and Southley Brook, as well as various tributaries of these and drainage channels. A number of reservoirs and ponds are also noted onsite and within 250 m of the Scoping Boundary.

Due to the extent of the pipeline, the catchment areas have not been listed at this stage.

Agricultural Land Classification

Towards the Holcim plant the Pipeline is predominantly Grade 3 to the north and Grade 4 to the south, with intermittent areas of Grade 5 land within the Scoping Boundary. Between the Central AGI Feeder and Connection AGI 2 Search Area the predominant ALC grade is Grade 3 with areas of Grade 2 and 4 along the extent of the Pipeline.

Coal Mining and Quarries

The Central Pipeline Scoping Boundary is outside of the Coal Mining Reporting Area. This section of the pipeline runs through the Cheshire Brine Compensation District near Middlewich.

There are >50 No. quarries noted onsite, with more recorded within 250 m of the pipeline. Due to the extent of the pipeline and number of quarries recorded these have not been listed at this stage. They are mostly ceased with a limited number noted as inactive.

Historical and Current Landfills

There are two historical landfills onsite in the Cauldon Cement Works and Leek areas, with a further thirteen historical landfills within 250 m of the Scoping Boundary. No further landfills (current or historical) noted within 250 m of the Scoping Boundary.

UXO Potential

Online Zetica UXO risk mapping shows a Low risk (15 bombs per 1,000 acres or less) for the Central Pipeline. Military bases were noted in the vicinity of Holmes Chapel, Chester and south of Ellesmere Port, as well as a Luftwaffe Target south of Ellesmere Port, although the risk remains Low.

Peak Cluster Pipeline (Central Section)

Current and Historical Potential Contaminative Land Uses

Potentially contaminative sources include:

- Onsite and offsite historical landfills
- Onsite and offsite railway land
- Onsite and offsite Made Ground (anticipated not recorded) – numerous highways and residential towns/villages
- Onsite and offsite infilled land (relating to infilled ceased quarries and/or ponds)
- Offsite Caudon Cement Works

Ground Gas

Potential for ground gas relating to the on/offsite infilled land, historical landfills, potential Made Ground and the Peat present in isolated areas across the Pipeline.

Baseline Data Sources

BGS 1:50,000 Mapping Drift, Sheet 97 for Runcorn (1977), Sheet 109 for Chester (1990)

BGS 1:63,360 Mapping Drift, Sheet 110 for Macclesfield (1968)

BGS 1:50,000 Mapping Solid, Sheet 109 for Chester (1986), Sheet 97 for Runcorn (1980) and Sheet 110 for Macclesfield (1997)

BGS 1:50,000 Mapping Solid and Drift, Sheet 124 for Ashbourne (1983)

Refer to Chapter 13.9 for all reoccurring references.

Sensitive Receptors

Human Health

- Construction and/or maintenance workers onsite for the pipeline, Central Feeder AGI and Connection AGI 2 Search Area.
- Site users and visitors including the general public, residents and workers at industrial sites such as Ellesmere Port.
- Adjacent site users including residents, the general public, workers and users of the surrounding agricultural fields.

Controlled Waters

- Presence of a Secondary Undifferentiated and Secondary A Aquifer associated with the superficial deposits and Secondary B and Principal Aquifers associated with the bedrock geology within the Scoping Boundary.
- Two SPZ1s noted from 80 m south-west of the Scoping Boundary. Additionally, 5 No. SPZ3s noted across the Pipeline, with SPZ2 for 3 No. of these within 1 km of the Scoping Boundary.
- Various watercourses and drainage channels noted onsite and within 250 m of the Scoping Boundary as listed above.

Built Environment

- Presence of residential, commercial and industrial properties within 250 m of the Scoping Boundary.

Sensitive Land Uses

- No Environmental Designations have been noted directly within the Central Pipeline Scoping Boundary. Two Sites of Special Scientific Interest have been noted within 250 m of the Scoping Boundary in the Middlewich and Holmes Chapel areas. The Peak District National Park is recorded directly adjacent to the Scoping Boundary.

Peak Cluster Pipeline (Central Section)

Agricultural Soils

Grade 3 ALC noted onsite between Central AGI Feeder and Ellesmere Port for the majority of the extent.

Future Baseline

The Proposed Development is situated across land occupied by agricultural fields and residential, commercial and industrial properties. Although there is a potential for the baseline presented in this chapter to change over time; it is considered that the data presented provides a good representation of the land use and geological and hydrogeological conditions at this stage of the Proposed Development; and thus, the baseline presented provides a realistic platform upon which to base any impact assessment work.

Table 13-9: Geology and Ground Conditions Baseline Environment – Peak Cluster Pipeline (West)

Peak Cluster Pipeline (West Section)

Geology

Artificial Ground – None recorded. However, Made Ground is anticipated.

Superficial Deposits – The Pipeline West extends between Ellesmere Port west towards Moreton, approximately 25 km in distance between the two points. Superficial deposits across this are predominantly Glacial Till, with isolated areas of Head deposits and Alluvium.

Bedrock Geology – The following geologies have been listed from east (Ellesmere Port) to west (Coastal AGI). Due to the high-level nature of this document and the number of bedrock geologies noted a full comprehensive list of all members within each formation has not been included. The pipeline extent is predominantly occupied by the Chester Formation south of the A552. Between here and the Coastal AGI, the lithologies include the Wilmslow Sandstone Formation, Tarporley Siltstone Formation, Helsby Sandstone Formation and Frodsham Sandstone Member.

Due to the linear extent of the Pipeline, no BGS boreholes or LGS/RIGS records have been reviewed at this stage.

Hydrogeology

Superficial Deposits – Glacial Till: Secondary Undifferentiated

Superficial Deposits –Alluvium: Secondary A Aquifer

Superficial Deposits – Head Deposits: Secondary B Aquifer

Bedrock – Chester Formation: Principal Aquifer

Bedrock – Remaining Geologies to the west: Secondary B Aquifer

All definitions of aquifers are provided in Table 13-4, Table 13-5 and Table 13-6.

A Source Protection Zone (SPZ) 3 is noted across the majority of the pipeline extent, with the SPZ2 and SPZ1 for each >1 km from the Scoping Boundary.

Hydrology

Along the extent of the Pipeline West the Storeton Brook and tributaries of the Raby Mere are noted within 250 m of the Scoping Boundary, as well as various drainage channels. A number of reservoirs and ponds are also noted onsite and within 250 m of the Scoping Boundary.

Agricultural Land Classification

The Pipeline West extent is predominantly an ALC Grade 3 with the area between Raby and Thornton Hough classified as Grade 2 and south of Arrow Park Hospital as Non-Agricultural land.

Peak Cluster Pipeline (West Section)

Coal Mining and Quarries

The Pipeline West Scoping Boundary is outside of the Coal Mining Reporting Area.

There are five quarries noted onsite of the pipeline, all ceased in status one in the vicinity of Arrowe Park and the other four west of Irby Hill

Historical and Current Landfills

There are no landfills recorded directly onsite of the Pipeline West; however, four historical landfills are present within 250 m in the AGI 3 Search area and Capenhurst area.

UXO Potential

Online Zetica UXO risk mapping shows records the following risk zones for the Pipeline West:

- Low risk (15 bombs per 1,000 acres or less) to the south-east of the Pipeline in the vicinity of Ellesmere Port and to the far north-west extent of the Pipeline
- Moderate risk (15 to 49 bombs per 1,000 acres) north-west of Hooton Station up to the Wirral and in the vicinity of Irby.
- High risk (50 or more bombs per 1,000 acres) to the north-west of the pipeline in the Wirral area (north of Barnston).

A military base was noted in the vicinity of Ellesmere Port, a decoy site north-west of Brimstage, as well as airfields and a Luftwaffe Target to the far north-western extent of the Pipeline.

Current and Historical Potential Contaminative Land Uses

Potentially contaminative sources include:

- Onsite and offsite railway land
- Onsite and offsite Made Ground (anticipated not recorded) – numerous highways, residential towns/villages and industrial sites
- Onsite and offsite infilled land (relating to infilled ceased quarries and/or ponds)
- Offsite historical landfills
- Offsite petrol filling stations

Ground Gas

Potential for ground gas relating to the on/offsite infilled land, historical landfills and potential Made Ground.

Baseline Data Sources

BGS 1:50,000 Mapping Bedrock with Superficial, Sheet 96 for Liverpool (2006)

BGS 1:50,000 Mapping Drift, Sheet 97 for Runcorn (1977)

BGS 1:50,000 Mapping Solid, Sheet 97 for Runcorn (1980)

Refer to Chapter 13.9 for all reoccurring references.

Sensitive Receptors

Human Health

- Construction and/or maintenance workers onsite for the pipeline and Connection AGI 2 Search Area.
- Site users and visitors including the general public, residents and workers at commercial sites and industrial sites such as Ellesmere Port.
- Adjacent site users including residents, the general public and workers of surrounding commercial / industrial businesses.

Peak Cluster Pipeline (West Section)

Controlled Waters

- Presence of a Secondary Undifferentiated, Secondary B and Secondary A Aquifer associated with the superficial deposits and Secondary B and Principal Aquifers associated with the bedrock geology within the Scoping Boundary.
- Various watercourses and drainage channels noted onsite and within 250 m of the Scoping Boundary as listed above.

Built Environment

- Presence of residential, commercial and industrial properties within 250 m of the Scoping Boundary.

Sensitive Land Uses

- No Environmental Designations have been noted within 250 m of the Scoping Boundary.

Agricultural Soils

Grade 3 ALC noted onsite for the majority of the pipeline extent.

Future Baseline

The Proposed Development is situated across land occupied by residential, commercial and industrial properties. Although there is a potential for the baseline presented in this chapter to change overtime; it is considered that the data presented provides a good representation of the land use and geological and hydrogeological conditions at this stage of the Proposed Development; and thus, the baseline presented provides a realistic platform upon which to base any impact assessment work.

Table 13-10: Geology and Ground Conditions Baseline Environment: Coastal AGI to MLWS Pipeline(s)

Coastal AGI to MLWS Pipeline(s)

Geology

Artificial Ground – None recorded however, Made Ground is anticipated.

Superficial Deposits – The Coastal AGI to MLWS Pipeline(s) extends between the Coastal AGI and MLWS, approximately 5 km in distance. Superficial deposits across this area are Glacial Till becoming Tidal Flat Deposits and Blown Sand towards Liverpool Bay.

Bedrock Geology – The bedrock geology typically comprises the Sidmouth Mudstone Formation, Tarporley Siltstone Formation Frodsham Sandstone Member and the Delamere Sandstone Member.

A total of seventeen available BGS boreholes were recorded onsite and a further eleven within 250 m of the Scoping Boundary. Due to the dense spacing between the boreholes a nominal amount of four scans were reviewed and detailed below:

SJ28NW14 – Onsite (south-west)

Sandy soil to 0.30 m bgl, sand to 0.80 m bgl, silty clay to 7.5 m bgl, silty clay with peat to 8.20 m bgl, peat to 8.60 m bgl, sandy silt to 9.5 m bgl, sand to 10.50 m bgl, pebbly clay to 11.50 m bgl, sand and gravel to 14.55 m bgl, Siltstone and Mudstone to 14.80 m bgl. Groundwater strike at 8.60 m bgl.

SJ28NW20 – Onsite (south-west)

Clayey soil to 0.50 m bgl, silty clay / clayey silt to 2.10 m bgl, peat to 2.80 m bgl, silty clay to 6.60 m bgl, peat to 7.0 m bgl, sandy pebbly clay to 8.10 m bgl, sand to 8.40 m bgl, clay to 11.0 m bgl, sandstone to 11.10 m bgl. Groundwater strike at 4.20 m bgl.

SJ28NW23 – Onsite (central)

Clay (Till) to 12.45 m bgl, Sandstone (Sherwood Sandstone) to 91.0 m bgl. Resting groundwater level at 0.48 m bgl.

Coastal AGI to MLWS Pipeline(s)

SJ28SW12 – 10 m north-east

Made Ground to 0.35 m bgl, Clay to 2.00 m bgl, Peat to 2.47 m bgl, sandy clay to 3.30 m bgl, clay to 11.40 m bgl, clayey sand to 12.40 m bgl, sandy clay to 15.50 m bgl, Mudstone to 18.20 m bgl.

Due to the extent of the pipeline, no LGS/RIGS records have been reviewed at this stage.

Hydrogeology

Superficial Deposits – Glacial Till: Secondary Undifferentiated

Superficial Deposits - Tidal Flat Deposits and Blown Sand: Secondary A Aquifers

Bedrock – All geologies: Secondary A Aquifers.

The definitions for Secondary A and Undifferentiated Aquifers are provided in Table 13-4.

A Source Protection Zone (SPZ) 3 extends within the Scoping Boundary to the south-west. All relating SPZ2 and SPZ1 zones are > 1 km.

Hydrology

A number of draining channels and the Eve-a-lyn-Farm watercourse is noted within 250 m of the Scoping Boundary. The Scoping Boundary enters into the Liverpool Bay.

The Coastal AGI to MWLS Pipeline(s) lies within the Briket including Arrowe Brook and Fender water body (ID: GB112068060530). The Chemical rating for the water body was Moderate (2022) and a Fail rating (as of 2019) due to poor livestock management (fish) and the ammonia, phosphate and PFOS content.

Agricultural Land Classification

The majority of the Scoping Boundary is within Grade 4 land, with the north and north-east designated as Grade 2 and Non-Agricultural land, respectively.

Coal Mining and Quarries

The Scoping Boundary is mostly outside of the Coal Mining Reporting Area (CMRA), with the area along Moreton Beach within a CMRA. No features relating to coal mining are noted within this area.

There are four quarries noted onsite to the north-east, with a further entry offsite of this within 250 m. The quarries are associated with a former Brickworks.

Historical and Current Landfills

Two historical landfills are noted onsite to the west and north-east, both extending offsite, with a third directly adjacent of the Scoping Boundary to the north. A permitted landfill is also recorded onsite to the north.

UXO Potential

Online Zetica UXO risk mapping shows a Low risk (15 bombs per 1,000 acres or less) for the majority of the Scoping Boundary, with the exception of the land to the far north-east which is High risk (50 or more bombs per 1,000 acres). A Luftwaffe Target and airfields are noted offsite to the south, two decoy sites onsite south-west and north-east) and a UXO find offsite to the north-east.

Current and Historical Potential Contaminative Land Uses

Potentially contaminative sources include:

- Onsite historical and current landfills, and offsite historical landfills
- Onsite Brickworks (identified through the quarry search)
- Onsite and offsite railway land, including offsite railway stations
- Onsite and offsite Made Ground (anticipated not recorded) – numerous highways, residential towns/villages and industrial sites

Coastal AGI to MLWS Pipeline(s)

- Onsite and offsite infilled land (relating to infilled ceased quarries and/or ponds)
- Offsite petrol filling station

Ground Gas

Potential for ground gas relating to the on/offsite infilled land, historical landfills and potential Made Ground.

Baseline Data Sources

Potential for ground gas relating to the on/offsite infilled land, historical landfills and potential Made Ground.

Sensitive Receptors

Human Health

- Construction and/or maintenance workers onsite for the pipeline and Coastal AGI locations.
- Site users and visitors including the general public, residents and workers at commercial and industrial sites
- Adjacent site users including residents, the general public and workers of surrounds commercial / industrial businesses.

Controlled Waters

- Presence of a Secondary Undifferentiated and Secondary A Aquifer associated with the superficial deposits and Secondary A Aquifer associated with the bedrock geology within the Scoping Boundary.
- A SPZ3 is noted within the Scoping Boundary, all SPZ2s and SPZ1s are >1 km.
- Eve-a-lyn-Farm, Liverpool Bay and drainage channels noted onsite and within 250 m of the Scoping Boundary as listed above.

Built Environment

- Presence of residential, commercial and industrial properties within 250 m of the Scoping Boundary.

Sensitive Land Uses

- Special Protection Area associated with the beaches surrounding the Wirral, which is located within the Scoping Boundary to the north.

Future Baseline

The Proposed Development is situated across land occupied by residential and industrial properties, as well as open land and the Moreton Beach. Although there is a potential for the baseline presented in this chapter to change overtime; it is considered that the data presented provides a good representation of the land use and geological and hydrogeological conditions at this stage of the Proposed Development; and thus, the baseline presented provides a realistic platform upon which to base any impact assessment work.

13.5 Planned Surveys

13.5.1 The following planned surveys are detailed within Table 13-11.

Table 13-11: Scope of Proposed Development Surveys

Survey	Scope of Survey	Survey Timings	Survey Area Extent	Justification
ALC Survey	The survey consists of a desk-based assessment (soil data and site characteristics), focussed field survey (sampling and logging) and reporting (classification of the land into its appropriate Grade).	Alongside Phase 1 Desk Study	Focussed on localised areas within the Scoping Boundary where initial ALC Grade is 3 or above	To determine the agricultural potential of land based on its physical characteristics. An ALC survey is required where land is predominantly greenfield or rural, to support planning applications and EIA.
Site Walkover	Assessment will include description of industrial processes / potential contaminative processes, ground cover, local changes in ground level, evidence of ground disturbance or instability, surface water courses, evidence of water logging/flooding/poor drainage and presence and condition of on-site structures with the potential to result in ground contamination.	Alongside Phase 1 Desk Study	Focusing on higher risk factors/ areas within the Scoping Boundary	Will be conducted as part of the review of geology and ground conditions baseline environment. The survey is undertaken following review of the environmental data to serve as a 'ground truthing' exercise, targeting those parts of the Study Area where potential higher risk factors have been identified. Additionally, the survey aims to identify on-site features that may not be directly identifiable from the environmental data set or used to confirm the presence of features identified during the desk-based review.
Phase 1 Desk Study	Report will include a desk-based review of data to provide the geological, hydrogeology, hydrological setting of the site and identify the potential sources, receptors and pathways present. This would result in an initial Conceptual Site Model outline the risk with respect to human health, controlled waters	Prior to any intrusive works and as part of Preliminary Environment Information Report and Environment Statement.	Extent of Scoping Boundary	A Phase 1 Desk Study is required under guidance and Contaminated Land Regulations to assess the potential risks to human health, controlled waters and the environment. The report forms part of the preliminary risk assessment in line with the EA's Land Contamination Risk Management (LCRM) guidance

Survey	Scope of Survey	Survey Timings	Survey Area Extent	Justification
	and the built environment in line with NHBC/EA R&D 66 and CIRIA C552.			
Ground Investigation (GI)	The requirement for and scope of the GI varies with the outcome of the Desk Study. In general, if required, a GI would comprise intrusive techniques (such as drilling and trial pitting) to retrieve soil samples, with subsequent installation of gas/groundwater monitoring wells (if required) to obtain groundwater samples. Samples are tested for contaminants identified within the Desk Study, and groundwater monitored to input into a GI report.	Following desktop study. The GI can be undertaken as part of detailed design.	If required, will be in specific focussed areas within the Scoping Boundary.	A GI is conducted to provide direct data on soil, rock and groundwater conditions beneath the site, with the ability to outline contaminated land (if present). It validates the Phase 1 Desk Study, confirming the CSM and is required by Local Planning Authorities where contamination and/or round risks are suspected. GI shall be coordinated with other disciplines (Geotech/Water) to minimise disruption to landowners and costs
Detailed UXO Risk Assessment	Details the onsite military activities, bombing density, post-war explosive ordnance activities and provides a UXO hazard assessment and risk rating dependent. Mitigation measures / recommendations are also provided based on the intrusive activities being undertaken.	Prior to any intrusive works	Extent of Scoping Boundary, though may be focussed on the LoD once established	A Detailed UXO Risk Assessment will be undertaken to quantify the UXO risk onsite in line with safe working practices – complying with CDM Regulations 2015 and the Health and Safety at Work Act 1974.

13.6 Identification of Potential Effects

- 13.6.1 The potential significant effects identified are based on the current preliminary assessment with the most sensitive receptors to be considered being the underlying aquifers, surface waters, human health and uncontaminated soils and geology.

13.6.2 Key aspects of the Proposed Development that may affect the Ground Conditions and Geology are presented below:

Construction

- Chemical spillages and leaks from plant and machinery used during construction, and from chemicals and other contaminants stored onsite causing pollution of ground and/or groundwater;
- Disturbance of environmental designation sites;
- Changes in subsoil structure and reduce in subsoil quality due to compaction from storage units onsite or from vehicle movements (potential for water logging);
- Requirement for dewatering which may reduce the flow of groundwater supported sites, abstractions and surface water bodies and changing soil hydrology locally;
- Disturbance of potentially contaminated soils, sediments of groundwater posing a risk to construction workers, groundwater and geology;
- Importation of contaminated aggregates posing a potential risk to human health and underlying geology and groundwater;
- Disturbance of soils releasing ground or mine gas posing a risk to construction workers and onsite infrastructure;
- Where the UXO risk is Moderate to High, there is a possibility during construction that unexploded ordnance device could be uncovered; and
- Trenchless techniques whereby drilling/excavation creates a pathway for drilling fluids or other fluids used during construction to reach sensitive groundwater (Principal Aquifers or abstractions) or sensitive water receptors.

Operation

- Routine operation is not likely to have significant effects on the underlying geology and groundwater;
- Permeable strata surrounding the pipeline may provide a preferential pathway for contaminants to migrate into non-contaminated soils, geology and groundwater; and
- Potential for aggressive ground conditions posing a risk to the pipeline.

Decommissioning

- Chemical spillage and leaks from plant and machinery and from chemicals stored onsite causing pollution to the underlying soils, geology and groundwater; and
- Requirement for dewatering to remove structures, reducing flow to groundwater abstractions and surface water bodies and changes to soil hydrology.

13.7 Scope and Methodology

13.7.1 This section outlines the scope and methodology that will be employed for assessing the likely significant effects associated with the geology and ground conditions.

Methodology

- 13.7.2 The methodology for the assessment of risks will comply with EA's (EA, 2025) guidance Land Condition Risk Management (LCRM) utilising source-pathway-receptor model. With respect to human health, exposure risks shall be based on the Contaminated Land Exposure Assessment (CLEA) Frameworks report and shall be appropriate to the particular end-uses in the development proposals. The CLEA model (version 1.071) amongst others shall be used to generate appropriate assessment criteria for the assessment of risk to human health.
- 13.7.3 The assessment of risks to controlled waters shall be undertaken in accordance with the EA guidance LCRM (2025) and Remedial Targets Methodology Hydrogeological Risk Assessment for Land Contamination (2006).
- 13.7.4 The methodology for assessing the likely significant effects of the Proposed Development on geology and ground conditions follows the standard guidance in DMRB LA109 Geology and Soils (National Highways, 2019a), DMRB LA113 Road Drainage and the Water Environment (National Highways, 2020), DMRB LA 104 Environmental Assessment and Monitoring (National Highways, 2020), Land Contamination Risk Management (EA, 2025) and A New Perspective on Land and Soil in Environmental Impact Assessment (Institute of Environmental Management and Assessment, 2022).
- 13.7.5 The assessment of receptor sensitivity for geology and ground conditions follows the procedure described in Table 3.11 of the DMRB LA 109 (National Highways, 2019a). The assessment of receptor value (importance) for groundwater / surface water resources follows the procedure described in Table 3.70 of the DMRB LA 113 (National Highways, 2020).
- 13.7.6 A level of sensitivity will be assigned to identified receptors (Very High to Negligible) based on existing information, with the magnitude of potential and residual impact (Major to Negligible) determined with the two factors compared to assess the overall significance of the effect, which will be classified as Negligible, Minor, Moderate or Major as defined in the Significance of Effects Matrix set out in Table 4-5 of Chapter 4 EIA Approach and Methodology.
- 13.7.7 Natural England reports the Agricultural Land Use Classification at the Proposed Development to include areas of Grade 2 and Grade 3 (Subgrade 3a and 3b have not been defined) land. An ALC survey will be required to determine the area lost for each ALC grade and determine the area of the 'best and most versatile agricultural land' Grades 1, 2 and 3a that may be lost. This will be reported in an Agricultural Land Classification Assessment Report and will support the ES. The approximate hectareage of Grade 3 areas has been included within Table 13-4 to Table 13-10 where suitable.

Magnitude of Impact

- 13.7.8 The magnitude of impact (i.e. potential impacts on identified receptors), associated with the Proposed Development will be considered as the impact experienced from the baseline conditions at the sensitive receptor and will be determined using a four-point scale as set out in (i.e. negligible, minor, moderate, and major) as set out in Table 4.2 Impact Magnitude Criteria of Chapter 4 EIA Approach and Methodology, taking into account the potential pathways through which an impact source/ hazard may affect identified receptors (Table 13-12).
- 13.7.9 These definitions are drawn from published policy and/or good practice guidance and based on professional judgements and have been successfully used on other assessments.

Table 13-12: Magnitude of Impact

Survey	Scope of Survey	Survey Area Extent	Justification
High Adverse	Result in loss of resource/designation or quality of the resource.	Geology	Loss of geological feature/designation and / or quality and integrity, severe damage to key characteristics, features or elements.
		Soils	Physical removal or permanent sealing of soil resource or agricultural land
	Human health: significant contamination identified. Contamination levels significantly exceed background levels and relevant screening criteria (e.g. category 4 screening levels – SP1010 (Contaminated Land: Applications in Real Environments (CL:AIRE, 2014))). Potential for significant harm to human health.	Contamination	Contamination heavily restricts future use of land.
	Results in loss of attribute and / or quality and integrity of the attribute.	Groundwater	Loss of, or extensive change to, an aquifer. Loss of regionally important water supply. Calculated risk of pollution from spillages $\geq 2\%$ annually (Spillage Assessment). Potential high risk of pollution to groundwater from routine runoff – risk score > 250 (Groundwater quality and runoff assessment). Loss of, or extensive change to Groundwater Dependent Terrestrial Ecosystems (GWDTE) or baseflow contribution to protected surface water bodies. Reduction in water body Water Framework Directive (WFD) classification. Loss or significant damage to major structures through subsidence or similar effects.
		Surface Water	Failure of both acute-soluble and chronic-sediment related pollutants in HEWRAT and compliance failure with EQS values.

Survey	Scope of Survey	Survey Area Extent	Justification
			Calculated risk of pollution from a spillage $\geq 2\%$ annually (spillage assessment). Loss or extensive change to a fishery. Loss of regionally important public water supply. Loss or extensive change to a designated nature conservation site. Reduction in water body WFD classification.
Medium Adverse	Results in partial loss of resource/designation or quality of the resource.	Geology	Partial loss of geological feature/designation, potentially adversely affecting the integrity; partial loss of / damage to key characteristics, features or elements.
		Soils	Permanent loss / reduction of one or more soil function(s) and restriction to current or approved future use (e.g. through degradation, compaction, erosion of soil resource).
	Human health: contaminant concentrations exceed background levels and are in line with limits of relevant screening criteria (e.g., category 4 screening levels SP1010). Significant contamination can be present.	Contamination	Control / remediation measures are required to reduce risks to human health / make land suitable for intended use.
	Results in effect on integrity of attribute, or loss of part of attribute.	Groundwater	Partial loss or change to an aquifer. Degradation of regionally important public water supply or loss of significant commercial / industrial / agricultural supplies. Potential medium risk of pollution to groundwater from routine runoff – risk score 150 to 250. Calculated risk of pollution from spillages $\geq 1\%$ annually and $< 2\%$ annually. Partial loss of the integrity of GWDTE. Contribution to reduction in water body WFD classification.

Survey	Scope of Survey	Survey Area Extent	Justification
Low Adverse			Damage to major structures through subsidence or similar effects or loss of minor structures.
		Surface Waters	Failure of both acute-soluble and chronic-sediment related pollutants in HEWRAT but compliance with EQS values. Calculated risk of pollution from spillages $\geq 1\%$ annually and $< 2\%$ annually. Partial loss in productivity of a fishery. Degradation of regionally important public water supply or loss of major commercial/industrial/agricultural supplies. Contribution to reduction in water body WFD classification.
	Results in minor measurable change in resource / designation.	Geology	Minor measurable change in geological feature / designation attributes, quality or vulnerability; minor loss of, or alteration to, one (may be more) key characteristics, features or elements.
		Soils	Temporary loss/reduction of one or more soil function(s) and restriction to current or approved future use (e.g., through degradation, compaction, erosion of soil resource).
	Human health: contaminant concentrations are below relevant screening criteria (e.g. category 4 screening levels SP1010). Significant contamination is unlikely with a low risk to human health.	Contamination	Best practice measures can be required to minimise risks to human health.
	Results in some measurable change in attributes, quality or vulnerability.	Groundwater	Potential low risk of pollution to groundwater from routine runoff – risk score < 150. Calculated risk of pollution from spillages $\geq 0.5\%$ annually and $< 1\%$ annually. Minor effects on an aquifer, GWDTEs, abstractions and structures.

Survey	Scope of Survey	Survey Area Extent	Justification
		Surface Waters	Failure of either acute soluble or chronic sediment related pollutants in HEWRAT. Calculated risk of pollution from spillages $\geq 0.5\%$ annually and $< 1\%$ annually. Minor effects on water supplies.
Very Low Adverse	Results in effect on attribute, but of insufficient magnitude to affect the use and integrity.	Geology	Very minor loss or detrimental alteration to one or more characteristics, features or elements of geological feature / designation. Overall integrity of resource not affected.
		Soils	No discernible loss/reduction of soil function(s) that restrict current or approved future use.
	Human health: contaminant concentrations substantially below levels outlined in relevant screening criteria (e.g., category 4 screening levels SP1010).	Contamination	No requirement for control measures to reduce risks to human health/ make land suitable for intended use.
	Results in effect on attribute, but of insufficient magnitude to affect the use and integrity.	Groundwater	No measurable impact upon an aquifer and / or groundwater receptors and risk of pollution from spillages $< 0.5\%$.
		Surface Waters	No risk identified by HEWRAT (pass both acute-soluble and chronic-sediment related pollutants). Risk of pollution from spillages $< 0.5\%$.
Low Beneficial	Results in some beneficial effect on attribute or a reduced risk of negative effect occurring.	Groundwater	Reduction of groundwater hazards to existing structures. Reductions in waterlogging and groundwater flooding.
		Surface Water	HEWRAT assessment of either acute soluble or chronic-sediment related pollutants becomes pass from an existing site where the baseline was a fail condition. Calculated reduction in existing spillage risk by 50% or more (when existing spillage risk is $< 1\%$ annually).
Medium Beneficial	Results in moderate improvement of attribute quality.	Groundwater	Contribution to improvement in water body WFD classification. Improvement in water body catchment abstraction management Strategy (CAMS) (or equivalent) classification.

Survey	Scope of Survey	Survey Area Extent	Justification
			Support to significant improvements in damaged GWDTE.
		Surface Water	HEWRAT assessment of both acute-soluble and chronic-sediment related pollutants becomes pass from an existing site where the baseline was a fail condition. Calculated reduction in existing spillage by 50% or more (when existing spillage risk >1% annually). Contribution to improvement in water body WFD classification
High Beneficial	Results in major improvement of attribute quality	Groundwater	Removal of existing polluting discharge to an aquifer or removing the likelihood of polluting discharges occurring. Recharge of an aquifer. Improvement in water body WFD classification.
		Surface Water	Removal of existing polluting discharge or removing the likelihood of polluting discharges occurring to a watercourse. Improvement in water body WFD classification.
No Change	No temporary or permanent loss in resource of designation.	Geology	No temporary or permanent loss/disturbance of characteristics features or elements.
		Soils	No loss/reduction of soil function(s) that restrict current or approved future use.
	Human health: reported contaminant concentrations below background levels.	Contamination	No intervention required.
	No loss or alteration of characteristics, features or elements.	Groundwater/Surface Water	No observable impact in either direction.

Sensitivity

13.7.10 The sensitivity of affected receptors will be considered on a scale of very high, high, medium, low or negligible. This differs slightly from the four-point scale noted in Table 4-3 Sensitivity Criteria however, these definitions are drawn from published policy and/or good practice guidance and based on professional judgements and have been successfully used on other assessments. The definitions are presented in Table 13-13.

Table 13-13: Receptor Sensitivity

Survey	Scope of Survey	Survey Timings	Survey Area Extent
Very High	Very rare and of international importance with no potential for replacement. Geology meeting international designation citation criteria which is not designated as such	Geology	UNESCO (United Nations Educational, Scientific and Cultural Organisation) World Heritage Sites, UNESCO, Global Geoparks, Sites of Special Scientific Interest (SSSIs) and Geological Conservation Review sites where citations indicate features of international importance.
	Soil directly supporting an EU designated site.	Soils	Special Area of Conservation (SAC), Special Protection Area (SPA), Ramsar Site; and/or ALC Grades 1 and 2.
	Human health: very high sensitivity land use.	Contamination	Residential or allotments.
	Nationally significant attribute of high importance.	Groundwater	Principal aquifer providing a regionally important resource and/or supporting a site designated under EC and UK legislation. Groundwater locally supports Groundwater Dependent Terrestrial Ecosystems (GWDTE). Source Protection Zone (SPZ1).
		Surface Water	Watercourse having a WFD classification shown in a RBMP and $Q95 \geq 1.0 \text{ m}^3/\text{s}$. Site protected/designated under EC or UK legislation (SAC, SPA, SSSI, Ramsar site, salmonid water)/Species protected by EC legislation LA 108
High	Rare and of national importance with little potential for replacement. Geology meeting national designation citation criteria which is not designated as such	Geology	Geological SSSIs and National Nature Reserves (NNRs).
	Soils directly supporting a UK designated site.	Soils	e.g. SSSIs; and/or ALC Grade 3a.
	Human health: high sensitivity land use.	Contamination	Public Open Space.
	Locally significant attribute of high importance.	Groundwater	Principal aquifer providing locally important resource or supporting a river ecosystem. Groundwater supports a GWDTE or SPZ2.

Survey	Scope of Survey	Survey Timings	Survey Area Extent
		Surface Water	Watercourse having a WFD classification shown in a RBMP and Q95
Medium	Of regional importance with limited potential for replacement. Geology meeting regional designation citation criteria which is not designated as such.	Geology	Regionally Important Geological Sites (RIGS).
	Soils supporting non-statutory designated sites.	Soils	Local Nature Reserves (LNRs), Local Geological Sites (LGS), Sites of Nature Conservation Importance (SNCIs). ALC Grade 3b.
	Human health: medium sensitivity land use.	Contamination	Commercial or industrial land.
	Of moderate quality and rarity.	Groundwater	Aquifer providing water for agricultural or industrial use with limited connection to surface water. SPZ3.
		Surface Water	Watercourses not having a WFD classification shown in a RBMP and Q9 5 >0.001m ³ /s.
Low	Of local importance/interest with potential for replacement.	Geology	Non designated geological exposures, former quarries / mining sites.
	Soils supporting non-designated notable or priority habitats.	Soils	ALC Grades 4 and 5.
	Low sensitivity land use	Contamination	Highways and rail
	Lower quality	Groundwater	Unproductive Strata.
		Surface Water	Watercourses not having a WFD classification shown in a RBMP and Q9 5 ≤0.001m ³ /s.
Very Low	No geological exposures, little/no local interest.	Geology	Significant depth of Made Ground.
	Soils: previously developed land formerly in 'hard uses' with little potential to return to agriculture.	Soils	Industrial land/soils not present.
	Human health: undeveloped surplus land, no sensitive land use proposed.	Contamination	Extensive areas of existing hard standing.

Survey	Scope of Survey	Survey Timings	Survey Area Extent
	Very Low is not applicable to Groundwater under Table 3.7 of LA 113.	Groundwater	N/A
	Very Low is not applicable to Surface Water under Table 3.7 of LA 113.	Surface Water	N/A

Determining the Significance of Effects

- 13.7.11 The level of effect attributed will be assessed based on the magnitude of change due to the Proposed Development and the evaluation of the sensitivity of the affected receptor, as well as a number of other factors. The level of effects will be based on professional judgement. For each of the potential impacts identified, an assessment will be made of the resulting level of effect on the receptor. The level of the effect will be assessed in accordance with Table 13-14 which is a tool which will assist with the process, and which takes into account the sensitivity of the receptor and the magnitude of change for the predicted effect. The assessment identifies whether the effects are beneficial or adverse for each receptor along with the significance. The table varies from the significance matrix detailed in Table 4-5 to account for the additional High Level Receptor Sensitivity category.
- 13.7.12 Major to Moderate effects are considered to be significant. In the assessment of the significance of a particular effect, professional judgement may also be applied to take account of site-specific factors that may be of relevance.

Table 13-14: Significance Matrix

Sensitivity of Receptor	Magnitude of Change				
		Very Low	Low	Medium	High
	Very High	Moderate	Moderate	Major	Major
	High	Negligible/Minor or	Minor/Moderate	Moderate	Major
	Medium	Negligible	Minor	Minor/Moderate	Moderate
	Low	Negligible	Negligible	Minor	Minor/Moderate
	Very Low	Negligible	Negligible	Negligible	Negligible/Minor

Consultation

- 13.7.13 Consultation and engagement will be undertaken with relevant authorities and statutory bodies as part of this EIA process. Likely consultees relevant to geology and ground conditions will include, but are not limited to, local authority contaminated land officers, the EA, Natural England and The Mining Remediation Authority.

Assumptions and limitations

- 13.7.14 To ensure transparency within the scoping process, the following limitations and assumptions have been identified:

- The assessment will rely on available data, and reasonable endeavours will ensure that the data is up to date. However, the accuracy of third-party data information cannot be confirmed;
- It is recognised that ground contamination may be present within the Scoping Boundary, but it is assumed that by the time of construction this area will either be fully remediated, with mitigation in place to avoid disturbing remedial works, or the alignment moved to avoid potential contamination; and
- If remedial works are required, it is assumed remediation will have occurred prior to construction;
- Assumed a desk-top study and site walkover will be undertaken to assess the assumption of ground contamination; and
- Assumed a ground investigation will be undertaken to inform the detailed design phase.

Summary of issues to be scoped in / out

13.7.15 A summary of the issues scoped in and scoped out for each of the key components of the Proposed Development are provided in the following tables.

Table 13-15: Geology and Ground Conditions Scope Summary – Capture Facilities

Geology and Ground Conditions – Capture Facilities				
Scope Scoped in ✓, scoped out ✗	Construction (C), Operation (O), Decommissioning (D)			Rationale
	C	O	D	
Construction Workers	✓	✗	✓	Potential for effects on Construction Workers during construction and decommissioning relating to contaminated land and ground gas.
Site Users	✓	✓	✓	Potential for effects on Site Users during all phases relating to contaminated land and ground gas.
Adjacent site users	✓	✓	✓	Potential for effects on Adjacent Site Users during all phases relating to contaminated land and ground gas.
Superficial (Secondary A, Secondary Undifferentiated) and Bedrock (Principal, Secondary A) Aquifers	✓	✓	✓	Potential for effects on the hydrogeology receptors during all phases and for effects on the Proposed Development from land contamination.

Geology and Ground Conditions – Capture Facilities				
Cauldon Shale Lake (Cauldon CPP) and River Noe and Peakshole Water (Hope CPP)	✓	✓	✓	Potential for effects on the hydrology during construction and decommissioning and for effects on the Proposed Development from land contamination.
Infrastructure (CCPs)	✓	✗	✓	Potential for effects on the built environment during construction and decommissioning relating to ground gas and aggressive ground conditions.
Environmental Designations – Peak District National Park, Special Area of Conservation, SSSI (Tunstead and Hope)	✓	✗	✓	Potential for effects on environmentally sensitive sites during construction and decommissioning and for effects on the Proposed Development from land contamination.
Methodology				
Review of available and purchased data records to provide information to input into the risk assessment source-pathway-receptor model with respect to the human health, controlled waters and the built environment receptors listed above. The assessment will be undertaken in line with EA guidance documents (12.5.1.5) and the likely significant effects on the geology and soils in line with the DMRB standards (12.5.1.6).				
Consultation				
Consultation will be undertaken with relevant statutory authorities including EA, Natural England, local authority contaminated land officers and the Mining Remediation Authority.				
Assumptions and Limitations				
The assessment is to be undertaken with only available data, with third-party accuracy unable to be confirmed. Should contamination be present, it is assumed that by the point of construction any necessary changes of route to avoid contamination or remedial activities will be undertaken, with all construction activities to be commenced following this.				

Table 13-16: Geology and Ground Conditions Scope Summary – Peak Cluster Pipeline and Coastal AGI to MLWS Pipeline(s)

Geology and Ground Conditions – Peak Cluster Pipeline and Coastal AGI to MLWS Pipeline(s)				
Scope Scoped in ✓, scoped out ✗	Construction (C), Operation (O), Decommissioning (D)			Rationale
	C	O	D	
Construction Workers	✓	✗	✓	Potential for effects on Construction Workers during construction and decommissioning relating to contaminated land, ground gas and mining (Pipeline East).
Site Users	✓	✓	✓	Potential for effects on Site Users during all phases relating to contaminated land, ground gas and mining (Pipeline East).
Adjacent site users	✓	✓	✓	Potential for effects on Adjacent Site Users during all phases relating to contaminated land and ground gas.
Superficial (Secondary A, Secondary B, Secondary Undifferentiated) and Bedrock (Secondary A, Secondary B, Principal) Aquifers	✓	✓	✓	Potential for effects on the hydrogeology receptors during all phases and for effects on the Proposed Development from land contamination.
Variou brooks as well as the Peak Forest Canal, River Goyt, River Dean, and the Macclesfield Canal (Pipeline East). Various brooks as well as the Trent and Mersey Canal, Wheelock River, River Weaver and Shropshire	✓	✓	✓	Potential for effects on the hydrology during construction and decommissioning and for effects on the Proposed Development from land contamination.

Geology and Ground Conditions – Peak Cluster Pipeline and Coastal AGI to MLWS Pipeline(s)				
Scope Scoped in ✓, scoped out ✗	Construction (C), Operation (O), Decommissioning (D)			Rationale
	C	O	D	
Union Canal (Central Pipeline). Storeton Brook and tributaries of Raby Mere (Pipeline West)				
Eve-a-lyn-Farm and Liverpool Bay	✓	✓	✓	Potential for effects on the hydrology during construction and decommissioning and for effects on the Proposed Development from land contamination.
Agricultural Land Use	✓	✓	✓	Potential for effects on livestock and crops during construction and decommissioning and for effects on the Proposed Development from land contamination.
Environmental Designations – Peak District National Park Special Areas of Interest and Special Protection Area	✓	✗	✓	Potential for effects on the hydrology during construction and decommissioning and for effects on the Proposed Development from land contamination.
Geological Designations	✓	✗	✗	Part of the Peak Cluster pipeline is within the Cheshire Brine Compensation District near Middlewich.
Methodology				
Review of available and purchased data records to provide information to input into the risk assessment source-pathway-receptor model with respect to the human health, controlled waters and the built environment receptors listed above. The assessment will be undertaken in line with EA guidance documents (12.5.1.5) and the likely significant effects on the geology and soils in line with the DMRB standards (12.5.1.6).				
Consultation				
Consultation will be undertaken with relevant statutory authorities including EA, Natural England, local authority contaminated land officers and the Mining Remediation Authority.				

Geology and Ground Conditions – Peak Cluster Pipeline and Coastal AGI to MLWS Pipeline(s)				
Scope Scoped in ✓, scoped out ✗	Construction (C), Operation (O), Decommissioning (D)			Rationale
	C	O	D	
Assumptions and Limitations				
The assessment is to be undertaken with only available data, with third-party accuracy unable to be confirmed. Should contamination be present, it is assumed that by the point of construction any necessary changes of route to avoid contamination or remedial activities will be undertaken, with all construction activities to be commenced following this.				

13.8 Mitigation

- 13.8.1 The Proposed Development will be designed, where possible, to avoid important geological features or resources, and sources of contamination, through careful routeing and site selection. The following mitigation measures have been outlined below:

Construction

- Ensure good site practice and management through the development, and adherence to the CEMP;
- Undertake a Phase 1 Desk Study to identify areas of potential soils and/or groundwater contamination. Where these areas are identified, if feasible, infrastructure would be moved to a different location;
- Where infrastructure couldn't be moved, ground remedial measures would be implemented and a Remediation Strategy devised and discussed with the regulatory authorities prior to any remedial works;
- Where trenchless techniques are required, a detailed hydrogeological assessment will be undertaken in high sensitivity groundwater environments;
- Where dewatering is required a detailed hydrogeological assessment will be undertaken and a dewatering scheme developed prior to construction to demonstrate that there is an effective strategy to manage water arising from the operations; and
- A GI will be undertaken with boreholes at major crossing points and additional boreholes and/or trial pits along the extent of the pipeline route to inform detailed design.

Operation

- Where applicable, the sites will be run under Environmental Permit(s) and will comply with this under the Environmental Permitting (England and Wales) Regulations 2016 (HM Government, 2016).
- Prevention of contamination will be a specific requirement of the Proposed Development. Therefore, it will be designed so that it will not create any new areas of ground contamination or pathways to receptors as a result of both construction and operation.

- The Proposed Development will be operated in line with appropriate standards, with appropriate controls to manage operational impacts, which is likely to include an Environmental Management System. A Surface Water Drainage Plan (SWDP) will be produced, which details the operational drainage systems to be implemented to control potential impacts from pollution to surface watercourses.
- Mitigation measures proposed during the operation of the Proposed Development include:
 - the implementation of standard industry practices to mitigate potential impacts from accidental spills or leaks to comply with industry best practice;
 - the storage and handling of processed chemicals will be undertaken in properly surfaced and bunded areas depending on the findings of the risk assessment implementation of rapid spill response planning and training depending on the findings of the risk assessment; and
 - the preparation of a groundwater quality monitoring plan depending on the findings of the controlled waters risk assessment (to be undertaken based on ground investigation data).

Decommissioning

- A DEMP would be produced. The DEMP would consider in detail all potential environmental risks and contain guidance on how risks can be removed or mitigated. This will include details of how geology and ground conditions should be managed during decommissioning and demolition.
- Potential environmental effects during the decommissioning phase would be broadly similar to those during the construction phase, although there would be a need to address impacts from the production of bulk wastes from demolition of buildings and hardstanding to be recycled for re-use.
- Decommissioning activities would be conducted in accordance with the appropriate guidance and legislation at the time of the relevant part of the Proposed Development's cessation of operation. It is anticipated that a large proportion of the materials resulting from any demolition would be recycled and a record kept to demonstrate that the maximum level of recycling and reuse has been achieved as part of the DEMP.

13.9 Summary

- 13.9.1 This chapter has identified the baseline conditions and the potential effects of the Proposed Development on the geology and hydrogeology characteristics within the Study Area, along with proposed embedded mitigation measures. These will be developed further within the ES.

13.10 References

- Ref 13-1** European Union (2000). The Water Framework Directive (2000/60/EC)
- Ref 13-2** European Union (2006). The Groundwater Directive (2006/118/EC)
- Ref 13-3** European Union (2004). The Environmental Liability Directive (2004/35/EC) (2004)
- Ref 13-4** European Union (2008). Classification Labelling & Packaging (CLP) Regulation (2008/1272/EC)
- Ref 13-5** European Union (2008). The Priority Substances Directive (2008/105/EC)

- Ref 13-6** HM Government (1990). Environmental Protection Act, 1990
- Ref 13-7** HM Government (1995). The Environment Act, 1995, 2021
- Ref 13-8** HM Government (2003). The Water Act 2003, 2013
- Ref 13-9** HM Government (1991). The Water Resources Act 1991
- Ref 13-10** HM Government (1991). The Land Drainage Act 1991
- Ref 13-11** HM Government (1952). Cheshire Brine Pumping (Compensation for Subsidence) Act 1952
- Ref 13-12** The Anti-Pollution Works Regulations 1999, SI 1999/1006
- Ref 13-13** Groundwater (England and Wales) Regulations, 2009 SI 2009/2902
- Ref 13-14** The Waste (England and Wales) Regulations 2011, SI 2011/988
- Ref 13-15** The Contaminated Land (England) Regulations, 2012 SI 2012/1380
- Ref 13-16** Environmental Damage (Prevention and Remediation) (England) Regulations, 2015 SI 2015/810
- Ref 13-17** The Environmental Permitting (England and Wales) Regulations 2016 SI 2016/1154
- Ref 13-18** The Water Environment (Water Framework Directive) Regulations 2017 SI 2017/407
- Ref 13-19** Department for Energy Security & Net Zero (2025). Overarching National Policy Statement for Energy (EN-1). Available at:
<https://assets.publishing.service.gov.uk/media/68093d68148a9969d2394f59/draft-nps-en-1.pdf>
- Ref 13-20** National Policy Statement for Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4) (2023)
- Ref 13-21** National Planning Policy Framework (2025)
- Ref 13-22** Planning Practice Guidance (2019)
- Ref 13-23** A Green Future: Our 25 Year Plan to Improve the Environment
- Ref 13-24** Environmental Improvement Plan 2023
- Ref 13-25** DMRB LA109 Geology and Soils (National Highways, 2019a)
- Ref 13-26** DMRB LA113 Road Drainage and the Water Environment (National Highways, 2020)
- Ref 13-27** DMRB LA 104 Environmental Assessment and Monitoring (National Highways, 2020)
- Ref 13-28** Land Contamination Risk Management (EA, 2025)
- Ref 13-29** A New Perspective on Land and Soil in Environmental Impact Assessment (Institute of Environmental Management and Assessment, 2022)
- Ref 13-30** British Geological Survey Map Sheet 96, Liverpool, Bedrock and Superficial 1:50,000 Scale (2006). Available at: British Geological Survey (BGS) | large image viewer | IIPMooViewer 2.0
- Ref 13-31** British Geological Survey Map Sheet 97, Runcorn, Drift 1:50,000 Scale (1977). Available at: British Geological Survey (BGS) | large image viewer | IIPMooViewer 2.0

- Ref 13-32** British Geological Survey Map Sheet 97, Runcorn, Solid 1:50,000 Scale (1980). Available at: British Geological Survey (BGS) | [large image viewer](#) | [IIPMooViewer 2.0](#)
- Ref 13-33** British Geological Survey Map Sheet 99, Chapel-en-le-Frith, Drift 1:50,000 Scale (1977). Available at: British Geological Survey (BGS) | [large image viewer](#) | [IIPMooViewer 2.0](#)
- Ref 13-34** British Geological Survey Map Sheet 99, Chapel-en-le-Frith, Solid 1:50,000 Scale (1987). Available at: British Geological Survey (BGS) | [large image viewer](#) | [IIPMooViewer 2.0](#)
- Ref 13-35** British Geological Survey Map Sheet 109, Chester, Drift 1:50,000 Scale (1990). Available at: British Geological Survey (BGS) | [large image viewer](#) | [IIPMooViewer 2.0](#)
- Ref 13-36** British Geological Survey Map Sheet 109, Chester, Solid 1:50,000 Scale (1986). Available at: British Geological Survey (BGS) | [large image viewer](#) | [IIPMooViewer 2.0](#)
- Ref 13-37** British Geological Survey Map Sheet 110, Macclesfield, Drift 1:63,360 Scale (1968). Available at: British Geological Survey (BGS) | [large image viewer](#) | [IIPMooViewer 2.0](#)
- Ref 13-38** British Geological Survey Map Sheet 110, Macclesfield, Solid 1:50,000 Scale (1997). Available at: British Geological Survey (BGS) | [large image viewer](#) | [IIPMooViewer 2.0](#)
- Ref 13-39** British Geological Survey Map Sheet 111, Buxton, Drift, 1:50,000 Scale (1978). Available at: British Geological Survey (BGS) | [large image viewer](#) | [IIPMooViewer 2.0](#)
- Ref 13-40** British Geological Survey Map Sheet 111, Buxton, Solid 1:50,000 Scale (1978). Available at: British Geological Survey (BGS) | [large image viewer](#) | [IIPMooViewer 2.0](#)
- Ref 13-41** British Geological Survey Map Sheet 124, Ashbourne, Solid with Drift 1:50,000 Scale (1983). Available at: British Geological Survey (BGS) | [large image viewer](#) | [IIPMooViewer 2.0](#)
- Ref 13-42** British Geological Survey GeoIndex Onshore. Accessed: October 2025. Available at: [GeoIndex \(onshore\) - British Geological Survey](#)
- Ref 13-43** Caudon Cement Plant Information. Accessed: October 2025. Available at: [Caudon Cement Plant](#)
- Ref 13-44** Defra Magic Maps. Accessed: October 2025. Available at: [MAGIC](#)
- Ref 13-45** Defra Catchment Data Explorer. Accessed: October 2025. Available at: [England | Catchment Data Explorer](#)
- Ref 13-46** Derbyshire County Council Ecology, Geology and Biodiversity. Accessed: October 2025. Available at: [Ecology, geology and biodiversity - Derbyshire County Council](#)
- Ref 13-47** Derbyshire Wildlife Trust – Hadfields Quarry. Accessed: October 2025. Available at: [Hadfields Quarry | Derbyshire Wildlife Trust](#)
- Ref 13-48** Google Earth Pro. Accessed: October 2025. Available at: [Google Earth](#)
- Ref 13-49** Mining Remediation Authority Interactive Map View. Accessed: October 2025. Available at: [Mining Remediation Authority Map Viewer](#)
- Ref 13-50** Staffordshire Ecological Record. Accessed: October 2025. Available at: [Staffordshire Ecological Record](#)

Ref 13-51 UK Soil Observatory Map Viewer. Accessed: October 2025. Available at: UK Soil Observatory

Ref 13-52 UXO Risk Maps. Accessed: October 2025. Available at: Risk Maps | Zetica UXO

14. Socio-Economics

14.1 Introduction

- 14.1.1 This chapter of the Scoping Report presents how the socio-economic, recreation and tourism assessment will consider the potential likely significant effects on socio-economic, recreation and tourism receptors that may arise from the construction, operation (including maintenance) and decommissioning of the Proposed Development (as described in Chapter 3 The Proposed Development). It describes the methodology and datasets to be used within the assessment, presents an overview of the baseline conditions, and identifies the potential likely significant effects to be considered within the assessment, and how these will be assessed for the purpose of an EIA. As detailed in Chapter 1 Introduction, Peak Cluster, will comprise the construction of Capture Facilities, Peak Cluster Pipeline and Coastal AGI to MLWS Pipeline(s).
- 14.1.2 The Scoping Boundary is illustrated in Figure 1-2.
- 14.1.3 This chapter should be read in conjunction with the following chapters which provide context for the Proposed Development and approach to the EIA:
- Chapter 2: Legislation and Planning Policy;
 - Chapter 3: The Proposed Development; and
 - Chapter 4: EIA Approach and Methodology.
- 14.1.4 The assessment will consider the potential for likely significant socio-economic, recreation and tourism effects on the following receptors:
- The labour market (including employment and supply chain effects);
 - Local communities; and
 - Land use (including local businesses, visitor attractions, tourism accommodation, community facilities, open space, utilities and renewable infrastructure and development land).
- 14.1.5 There are important interconnections between the potential impacts on socio-economics, recreation, tourism, and other environmental topics. For instance, amenity-related effects on these receptors are examined within their respective chapters. To prevent duplication or double-counting of significant effects, the assessment has been designed to integrate findings from related topics. This approach also considers the possibility of cumulative or in-combination effects. Accordingly, please consult the following chapters for further detail:
- *Chapter 5: Air Quality* – amenity effects on residential and community receptors, and local businesses in the Study Area;
 - *Chapter 7: Landscape and Visual* – amenity effects on population and users of promoted recreational routes and PRoW of significance in the Study Area;
 - *Chapter 8: Traffic and Movement* – impacts on access and promoted recreational routes and PRoW of significance in the Study Area;
 - *Chapter 9: Noise and Vibration* – amenity effects on noise and vibration sensitive receptors, including residential and community receptors, local businesses, and users of promoted recreational routes and PRoW in the Study Area; and
 - *Chapter 13: Geology and Ground Conditions* – impacts on farm holdings;

- *Chapter 15: Human Health* – amenity effects on population and users of promoted recreational routes and PRoW of significance in the Study Area.

14.1.6 This chapter also outlines the baseline socio-economic conditions across the Study Area, adopting a route-wide approach to improve clarity and avoid repetition. While it provides an overview of relevant local authority districts, regional comparators, and England as a whole, the detailed assessment of local receptors, including businesses, community assets, development land, utilities, renewables infrastructure, recreational routes, PRoW, and open spaces, will be undertaken at the next stage.

14.2 Legislation, Policy and Guidance

14.2.1 Legislation and policy relevant to the Proposed Development and this chapter is outlined in Chapter 2: Legislation and Planning Policy. Additional relevant policies, legislation and guidance to the socio-economics have been reviewed and presented in Table 14-1, Table 14-2 and Table 14-3 below.

Table 14-1: Legislation Relevant to Socio-economics

Legislation
The Town & Country Planning (Minerals) Act 1981 (Ref 14-2)

Table 14-2: Planning Policy Relevant to Socio-economics

National Planning Policy
The UK's Modern Industrial Strategy (Ref 14-3)
The Overarching National Policy Statement (NPS) (EN-1) (Ref 14-22)
Regional and Local Planning Policy
West Midlands Regional Energy Strategy (Ref 14-4)
East Midlands Vision for Growth (Ref 14-5)
Net Zero North West Cluster Plan (Ref 14-6)
Peak District National Park Local Development Framework (Ref 14-23)
High Peak Borough Council Growth Strategy 2025-2028 (Ref 14-8)
Derbyshire Dales Local Plan Review (Ref 14-7)
Cheshire East Local Plan (Ref 14-10)
Cheshire West and Chester Local Plan (Ref 14-11)
Wirral Local Plan 2022–2040 (Ref 14-12)
Staffordshire Moorlands Local Plan (Ref 14-13)

Table 14-3: Relevant standards and guidance

Relevant standards and guidance
Homes & Communities Agency (HCA) Additionality Guide (Ref 14-1)

14.3 Defining the Study Area

14.3.1 The Study Area for the assessment of socio-economic, recreation and tourism effects varies depending on the likely spatial extent of the effect under consideration.

14.3.2 The Study Area for each receptor type that are taking into account within the assessment are presented in Table 14-4.

Table 14-4: Receptor Types and the Associated Geographical Area for Direct and Indirect Effects

Receptor type	Study Area for direct effects	Study Area for indirect effects
Population and Deprivation	Receptors located within the Scoping Boundary	Receptors located within a regional and sub-regional level
Economy and Employment	Receptors located within a regional and sub-regional level	Receptors located within a regional and sub-regional level
Tourism and recreation	Receptors located within the Scoping Boundary	Receptors located within 5 km of the Scoping Boundary
Local business and community receptors	Receptors located within the Scoping Boundary	Receptors located within 500 m of the Scoping Boundary
Development land, utilities and renewables infrastructure	Receptors located within the Scoping Boundary	Receptors located within 500 m of the Scoping Boundary
Strategic housing land allocations	Receptors located within the Scoping Boundary	Receptors located within 500 m of the Scoping Boundary
Open space	Receptors located within the Scoping Boundary	Receptors located within 500 m of the Scoping Boundary

14.4 Baseline Environment

Data Sources

14.4.1 A summary of baseline socio-economic conditions has been collated and presented based upon review of the following datasets:

- ONS (2021), Census 2021 (Ref 14-14);
- ONS (2023), UK Business Register and Employment Survey (Ref 14-15);
- ONS (2024) Mid-year population estimates (Ref 14-16);
- Ministry of Housing, Community and Local Government (now Department for Levelling Up, Housing and Communities) (2019), English Indices of Deprivation (Ref 14-17);
- ONS (2025), Regional Gross Value Added (balanced) per head and income components (Ref 14-18);
- ONS (2025) Population projections (Ref 14-19);
- Visit Britain (2019), England Domestic Tourism (Ref 14-20); and
- Visit Britain (2016), England Accommodation Stock Audit (Ref 14-21).

- 14.4.2 Baseline data collection is ongoing, with additional datasets from local planning authorities and third-party stakeholders to be incorporated at the PEI Report and ES stages, complementing existing sources and supporting detailed mapping and analysis of receptors, development land, and potential project interfaces.

Baseline

- 14.4.3 The Proposed Development comprises multiple components, including four Capture Facility sites the Peak Cluster Pipeline (which has been divided into broad sections for the purpose of the assessment at this stage) and the Coastal AGI to MLWS Pipeline(s), as outlined in Chapter 3: The Proposed Development. These elements span several local authorities and regions, as shown in Table 14-5.

Table 14-5: Elements of the Proposed Development and the Associated Geographical Areas

Element of the Proposed Development	Local authority	Region
Capture Facility		
Breedon	High Peak Peak District National Park Authority Derbyshire Dales	East Midlands
Tarmac	High Peak	East Midlands
Buxton Lime	High Peak	East Midlands
Holcim	Staffordshire Moorlands	West Midlands
Pipeline sections		
Capture Facility connections	High Peak Staffordshire Moorlands	East Midlands West Midlands
Onshore East	High Peak Derbyshire Dales Peak District National Park Authority	East Midlands
Onshore Central	Cheshire East	North West
Onshore West including Coastal AGI to MLWS Pipeline	Cheshire West Chester Wirral	North West

- 14.4.4 For the purposes of this chapter, a whole scheme approach has been adopted to support clarity and avoid duplication, particularly given the range of receptor types and the geographical extent of features such as long-distance recreational routes.
- 14.4.5 Baseline data is presented at the project-wide level for each local authority within the Study Area, rather than by individual project component in line with established best practice.
- 14.4.6 A more detailed, localised assessment of receptors will be provided within the PEIR. At that point, assessments may be structured by individual elements of the Proposed Development.

- 14.4.7 Potential impacts will be assessed relative to the baseline conditions and benchmarked against regional and national indicators, with key measures outlined in Paragraph 14.4.1 which includes Data Sources.

Baseline Analysis

Population and deprivation

- 14.4.8 The estimated population by geographical area within the Study Area is presented in Table 14-6 below. Cheshire East Council is the largest local authority within the Study Area by population, with an estimated population of approximately 421,000, followed by Cheshire West and Chester at 372,000, and Wirral at 329,000. The smallest authorities are Derbyshire Dales at 72,000, High Peak at 92,000, and Staffordshire Moorlands at 97,000, each with populations considerably smaller than the larger urban authorities within the Study Area.
- 14.4.9 As shown in Plate 14, between 2014 and 2024, population growth across the Study Area has varied considerably. Cheshire West and Chester (+11.9%) and Wirral (+10.5%) recorded the highest growth rates, well above the national average of +5.9%. Cheshire East (+6.2%) is broadly in line with the national trend, while Staffordshire Moorlands (+2.5%), High Peak (+1.2%), and Derbyshire Dales (+0.9%) experienced notably lower growth. At the regional level, all three regions, North West (+9.1%), East Midlands (+7.8%), and West Midlands (+8.4%), exceeded the national average.

Table 14-6: Geographical Areas by Population (Ref 14-16)

Geographical Area	Population
Local Authorities	
High Peak Council	92,000
Derbyshire Dales District Council	72,000
Cheshire East Council	421,200
Cheshire West and Chester Council	372,000
Wirral Council	329,000
Staffordshire Moorlands Council	97,000
<i>It should be noted that the PDNPA has not been included as a separate local authority as its counts are included within other council counts</i>	
Regions	
East Midlands	5,063,000
North West	7,737,000
West Midlands	6,187,000
National	
England	58,620,000

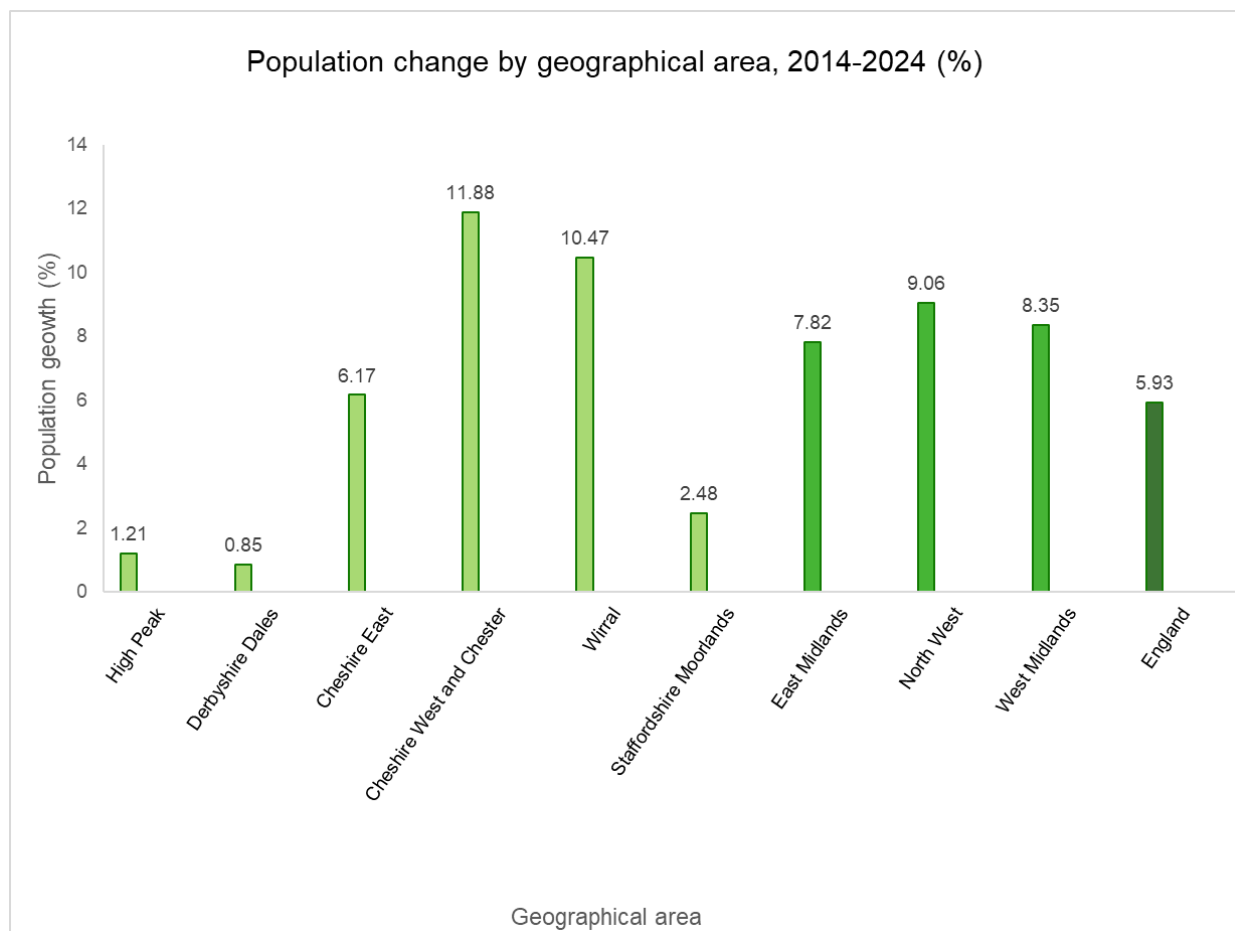


Plate 14-1: Population change by geographical area, 2014-2024 (Ref 14-16)

- 14.4.10 Plate 14-2 shows the age profile across the Study Area. All local authorities have a smaller working-age share than England (62.9%). At the local-authority level, the highest working-age share is in Cheshire West and Chester (61.4%), followed by High Peak (60.6%). The lowest shares are in Derbyshire Dales (56.6%) and Staffordshire Moorlands (57.6%), indicating comparatively older populations in these rural districts.
- 14.4.11 At the national level, 0-15s comprise 19.8%, and over 65's+ are at 20.2%. Within the Study Area, Derbyshire Dales has a notably lower 0-15 share (14.1%) and higher 65+ share (29.3%) than regional and national averages; Staffordshire Moorlands also has a low 0-15 share of 15.4% and an elevated 65+ share of 27.1%. It should be noted that the PDNPA has not been included as a separate local authority as its counts are included within other council counts.

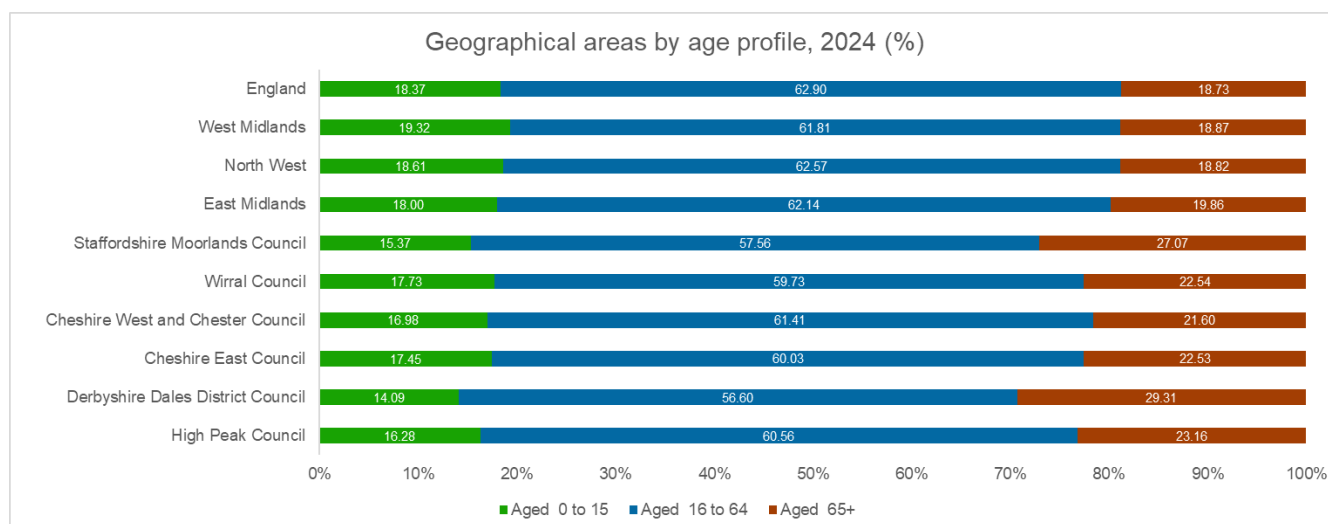


Plate 14-2: Geographical Areas by Age Profile, 2024 (Ref 14-16)

14.4.12 Table 14-7 highlights variation in deprivation among local authorities. Wirral Council is the most deprived, ranking 42nd nationally, with 25.2% of its LSOAs among the 10% most deprived in England. Cheshire West and Chester (161st) sits near the middle of the rankings. Derbyshire Dales is the least deprived by rank (263rd), while Staffordshire Moorlands has no LSOAs in the most deprived 10% nationally.

Table 14-7: Local Authorities within the Study Area by Average IMD Score Rank and Proportion of LSOAs Within the Most Deprived 10% Nationally (Ref 14-17)

Geographical Area	IMD - Rank of average score	IMD - Proportion of LSOAs in most deprived 10% nationally
Local Authorities		
High Peak Council	202	5.1%
Derbyshire Dales District Council	263	2.3%
Cheshire East Council	216	1.7%
Cheshire West and Chester Council	161	7.6%
Wirral Council	42	25.2%
Staffordshire Moorlands Council	206	0.0%
<i>It should be noted that the PDNPA has not been included as a separate local authority as its counts are included within other council counts.</i>		

Economy and Employment

14.4.13 Plate 14-3 presents Gross Value Added (GVA) per head in the regions within the Study Area compared to the national average for 2013-2023. As of 2023, GVA per head across all three regions is lower than the national average (£36,600). The North West has the highest GVA per head of the three regions (£32,000), compared to £28,700 in the West Midlands and £28,000 in the East Midlands. Notably, GVA per head has grown at a faster rate over the 10 year period for the North West, having grown by 51% compared to the national average having grown by 46%.

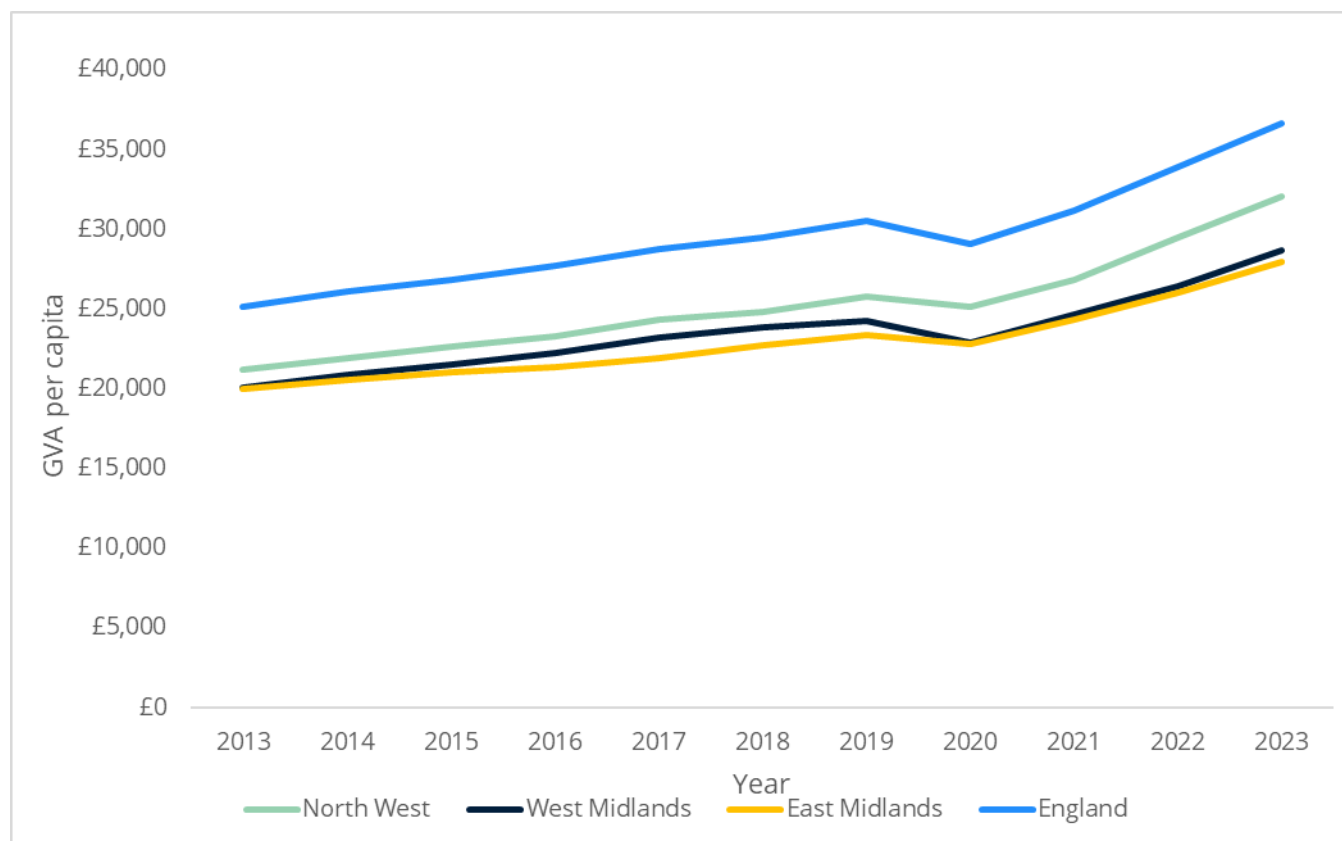


Plate 14-3: GVA per capita, regional and national, 2013-2023 (Ref 14-18)

14.4.14 Plate 14-4 shows the geographical areas within the Study Area by percentage of the population aged 16 years and over with a degree-level qualification (National Vocational Qualification (NVQ) Level 4) and with no qualifications. Across the Local Authorities in the Study Area, educational attainment levels display a consistent pattern with most authorities having broadly similar proportions of residents with degree-level qualifications and without qualifications, clustering around the middle range. Derbyshire Dales stands out with the highest proportion of degree-level qualifications (39.2%) and High Peak with the lowest proportion without any qualifications (14.9%). In contrast, Wirral and Staffordshire Moorlands record the lowest levels of educational attainment, with the smallest shares of degree-level qualifications (31.5% and 28.4% respectively) and the highest or near-highest proportions of residents without qualifications. Staffordshire Moorlands is the only local authority with lower levels of educational attainment than the national average across both measures.

14.4.15 At the regional level, there is a clear pattern of lower educational attainment compared to the national average across both measures. The North West records the highest proportion of residents with degree-level qualifications (31.2%) among the three regions, followed by the West Midlands (29.4%) and the East Midlands (29.1%). Conversely, all three regions report a higher

proportion of people without qualifications than the national average, with the West Midlands highest (21.1%), followed by the North West and East Midlands (both 19.5%).

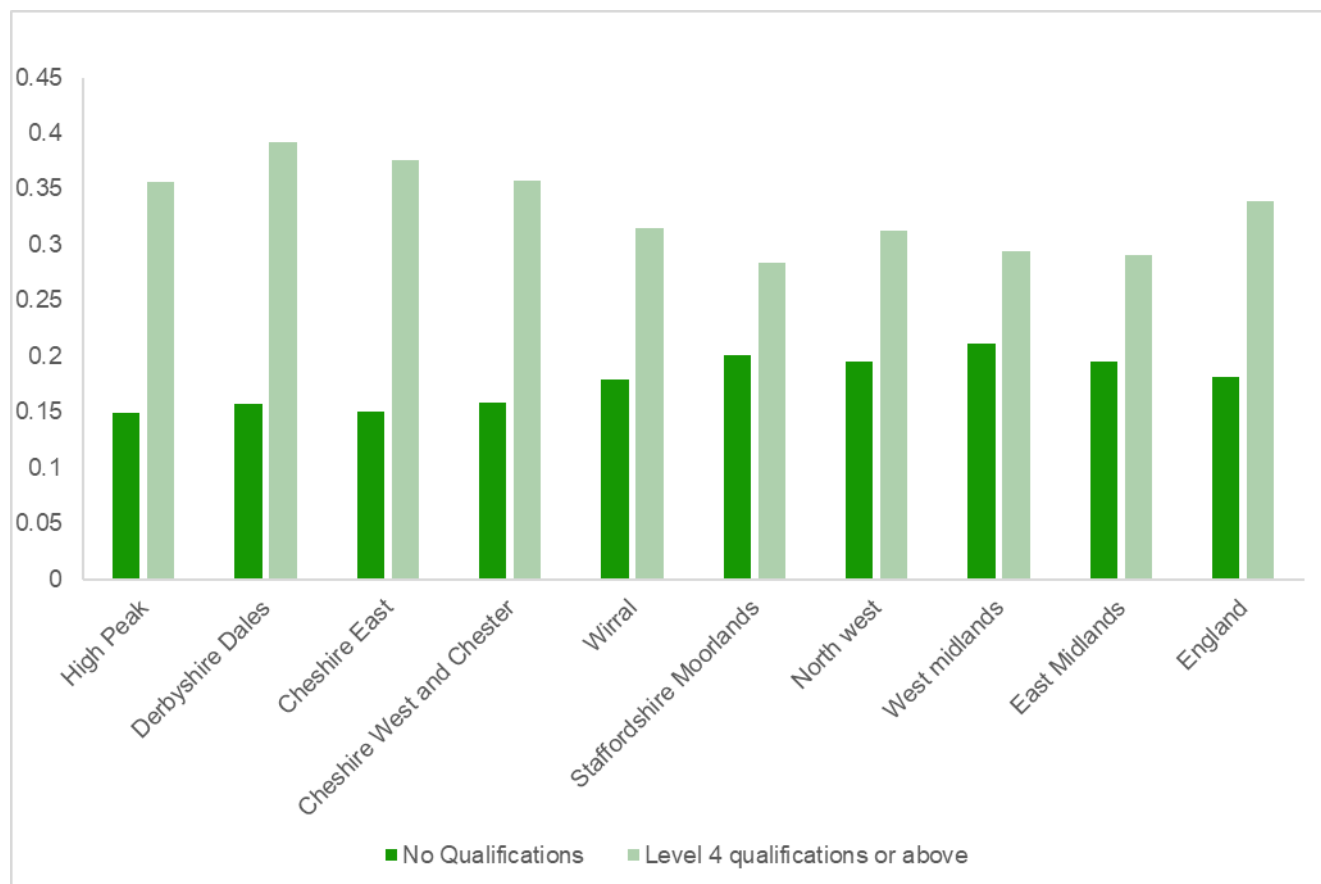


Plate 14-4 Geographical Areas by Proportion of the Population with an NVQ of Level 4 (Degree-Level) or above and With No Qualifications (Ref 14-15)

- 14.4.16 Table 14-8 shows the geographical areas within the Study Area by economic activity and unemployment rate among the population aged 16 years and over. Economic activity across the Study Area varies moderately between local authorities, ranging from 56% in Wirral to 61% in High Peak. The local-area average (around 59%) sits just below the England benchmark (61%), indicating broadly comparable levels of labour market participation. High Peak (61.4%) records slightly higher activity than the national rate, while Derbyshire Dales (56.3%) and Wirral (56.1%) fall notably below both national and regional averages, reflecting a relatively smaller proportion of working-age residents in employment or seeking work.
- 14.4.17 Unemployment rates remain uniformly low across the Study Area, between 1.9% in Derbyshire Dales and 2.9% in Wirral, averaging around 2.5%, which is below both the national (3.5%) and regional benchmarks. This suggests generally stable labour market conditions and limited short-term employment pressures, even in areas where economic activity rates are comparatively lower.

Table 14-8: Geographical areas by economic activity and unemployment rate (Ref 14-15)

Geographical area	Economic activity rate (%)	Unemployment rate (%)
Local Authorities		
High Peak Council	61.4%	2.5%
Derbyshire Dales District Council	56.3%	1.9%
Cheshire East Council	60.8%	2.4%
Cheshire West and Chester Council	60.0%	2.8%
Wirral Council	56.1%	2.9%
Staffordshire Moorlands Council	57.7%	2.0%
<i>It should be noted that the PDNPA has not been included as a separate local authority as its counts are included within other council counts</i>		
Regions		
East Midlands	59.9%	3.0%
North West	58.9%	3.4%
West Midlands	58.8%	3.9%
National		
England	60.9 %	3.5%

14.4.18 Table 14-9 shows the value of tourism in each local authority within the Study Area. Among the local authorities, Cheshire West and Chester attract the highest number of visitors and associated spend in the Study Area, with over 13 million combined day and overnight visits generating nearly £787 million annually. Derbyshire Dales also records strong overnight tourism, with 0.58 million trips generating £109 million. In contrast, Staffordshire Moorlands receives the lowest visitor numbers and spend, with just 1.76 million visits generating £57 million. Wirral are more day-trip oriented, while High Peak shows a more balanced split between day and overnight visits.

Table 14-9: Geographical Areas Within the Study Area by Day and Overnight Visits and Total Spend (Ref 14-15)

Geographical area	Day visits volume, annual average (millions)	Day visits spend, annual average (£millions)	Overnight trips, annual average (millions)	Overnight spend, annual average (£millions)
Local Authorities				
High Peak Council	4.44	£69.33	0.36	£72.00
Derbyshire Dales District Council	6.89	£155.81	0.58	£109.33
Cheshire East Council	9.21	£153.19	0.47	£65.67

Geographical area	Day visits volume, annual average (millions)	Day visits spend, annual average (£millions)	Overnight trips, annual average (millions)	Overnight spend, annual average (£millions)
Cheshire West and Chester Council	12.36	£611.60	0.93	£175.00
Wirral Council	4.46	£74.28	0.15	£16.33
Staffordshire Moorlands Council	1.51	£20.56	0.25	£36.33
<i>It should be noted that the PDNPA has not been included as a separate local authority as its counts are included within other council counts.</i>				

14.4.19 Table 14-10 shows the number and proportion of jobs in the tourism sector by local authority. Employment in the tourism industry across the Study Area varies considerably between local authorities. Derbyshire Dales has the highest relative dependence on tourism (14.3 % of total employment, equivalent to around 4,600 jobs), followed by Staffordshire Moorlands (12.2%), High Peak (9.8%), and Cheshire West and Chester (9.3%), all above the national average of 8.2%. In contrast, Cheshire East (7.6%), and Wirral (7.8%) fall below or broadly align with regional averages.

Table 14-10: Geographical Areas by Employment in the Tourism Industry: Absolute Employment and as a Proportion of Total Employment (Ref 14-15)

Geographical area	Total employment in the tourism industry	Employment in the tourism industry (% of total)
Local Authorities		
High Peak Council	3,045	9.8%
Derbyshire Dales District Council	4,600	14.3%
Cheshire East Council	15,800	7.6%
Cheshire West and Chester Council	15,750	9.3%
Wirral Council	7,950	7.8%
Staffordshire Moorlands Council	3,650	12.2%
<i>It should be noted that the PDNPA has not been included as a separate local authority as its counts are included within other council counts</i>		
Regions		
East Midlands	152,500	7.2%
North West	280,000	7.9%
West Midlands	206,500	7.6%
National		
England	2,237,000	8.2%

14.4.20 Table 14-11 summarises the number of bedspaces available by accommodation type and geographical area according to the 2016 Visit Britain survey of accommodation stock. Serviced accommodation includes hotels and similar establishments, such as bed and breakfasts (B&Bs), and non-serviced accommodation includes holiday lets, caravan parks and tourist campsites, and other collective accommodation. In total, there are 2,498 bedspaces among the local authorities within the Study Area. Derbyshire Dales has the highest total of serviced and non-serviced bedspaces; The majority of these bedspaces are made up of holiday dwellings. Occupancy data from the Visit Britain survey indicates a hotel occupancy rate of 81% over the peak months (June, July and August). Applying a 19% spare capacity rate indicates that there could be 474 spare bedspaces within the LPAs over the peak tourist season. This analysis will be reviewed further at PEIR and ES stages.

Table 14-11: Total Bedspace Stock by Geographical Area and Accommodation Type (Ref 14-21)

Geographical area	Total Serviced and Non-serviced	Serviced Accommodation	Total Non-serviced accommodation
Local Authorities			
High Peak Council	487	152	335
Derbyshire Dales District Council	1,019	297	722
Cheshire East Council	301	221	80
Cheshire West and Chester Council	368	251	117
Wirral Council	83	62	21
Staffordshire Moorlands Council	199	80	119
<i>It should be noted that the PDNPA has not been included as a separate local authority as its counts are included within other council counts</i>			
Regions			
East Midlands	4,866	2,382	2,484
North West	9,903	4,994	4,909
West Midlands	3,260	2,175	1,085
National			
England	65,219	33,374	31,845

Next Steps for Baseline Assessment

- 14.4.21 The ES will undertake a detailed assessment of tourism, recreation, and community receptors within the Study Area. This will include identifying strategic visitor attractions, clusters of tourism assets, and community facilities that may be sensitive to construction or operational impacts. The assessment will draw on stakeholder engagement, spatial datasets, and relevant planning and economic evidence to understand potential effects on access, amenity, and local economic activity.
- 14.4.22 Specific receptor groups to be assessed will include local businesses and community facilities, development land, utilities and renewables infrastructure, publicly accessible open spaces, private residential properties, and tourism accommodation. These receptors will be identified and

mapped using national datasets such as OS AddressBase, OS Local Important Buildings, and OS Open Greenspace, alongside planning data and stakeholder input.

- 14.4.23 The assessment will consider patterns of use, sensitivities, and potential interactions with the Proposed Development, with findings integrated across topic chapters to avoid duplication. Community facilities, open space, business and tourism receptors will be identified using web mapping of OS data, cross-checked against internet searches, and considering stakeholder feedback. The baseline for promoted and recreational routes will also draw on OS data, as well as information from the relevant local planning authorities, maps of Sustrans National Cycle Network routes, and the baseline collected by Chapter 8: Traffic and Movement.

Future Baseline

- 14.4.24 Table 14-12 presents ONS 2022 based population projections by age group to 2047. Cheshire East, and Cheshire West and Chester are all set to grow faster than the national average (12.7%), with Cheshire East notably high (23%), almost double the national figure. In contrast, Wirral (7%) and Staffordshire (2%) are well below the national average.
- 14.4.25 For the 15–64 age group, national growth is projected at 10.6%. Cheshire East (19.5%) and Cheshire West and Chester (14.3%) are all above this, whilst the remaining four local authorities fall below, with Staffordshire notably declining (-2%).
- 14.4.26 All local authorities are expected to see marked increases in residents aged 65 and over, in line with wider trends. Cheshire East stands out with the highest projected rise (46.4%), whereas Wirral (25.1%) and Staffordshire (20.1%) are substantially below the national average. The data highlights Cheshire East as consistently high across all age groups, while Staffordshire lags behind, especially in the working-age and older populations.

Table 14-12: Geographical Areas Within the Study Area by Projected Population Change from 2022 to 2047 – Total and by Age Group (Ref 14-19)

Geographical area	% change, 0-14	% change, 15-64	% change, 65+	All
Local Authorities				
High Peak Council	-7.5%	5.9%	35.4%	10.4%
Derbyshire Dales District Council	-6.9%	3.5%	35.4%	11.2%
Cheshire East Council	3.9%	19.5%	46.4%	23.0%
Cheshire West and Chester Council	-3.8%	14.3%	42.5%	17.4%
Wirral Council	-12.6%	5.8%	25.2%	7.0%
Staffordshire Moorlands Council	-14.4%	-2.0%	20.2%	2.1%
<i>It should be noted that the PDNPA has not been included as a separate local authority as its counts are included within other council counts</i>				
Regions				
East Midlands	-9.0%	10.9%	38.8%	13.0%
North West	-5.8%	12.8%	31.6%	13.1%

Geographical area	% change, 0-14	% change, 15-64	% change, 65+	All
West Midlands	-7.3%	11.0%	32.4%	11.8%
National				
England	-7.2%	10.6%	38.6%	12.7%

14.4.27 Plate 14-5 shows a population pyramid of the total population in the local authorities within the Study Area in 2022, with the grey bars representing an increase in population between 2022 and 2047. The significant widening of the top of the pyramid reflects an ageing population, with an increasing proportion of the population in the area aged 65 and over.

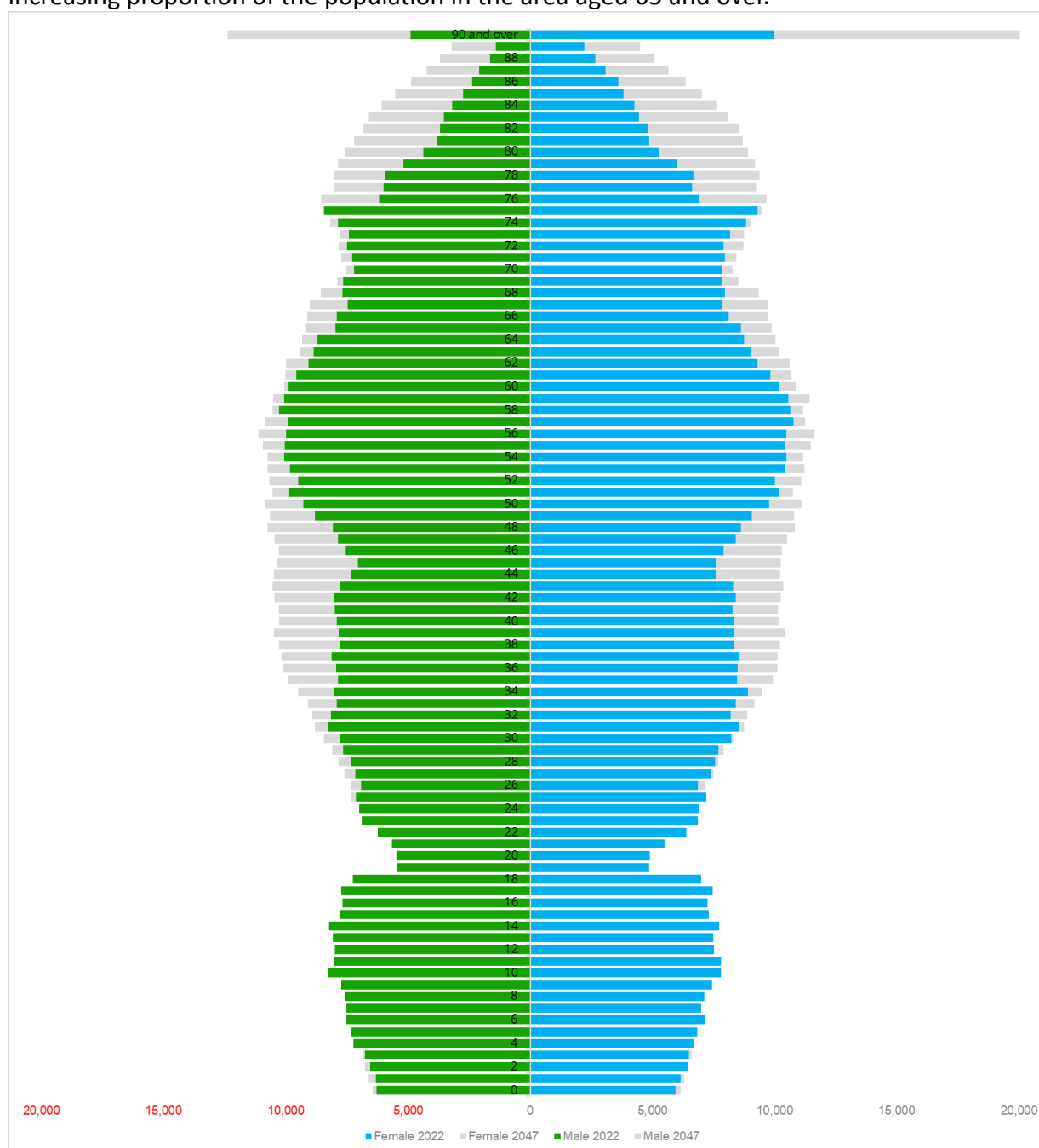


Plate 14-5: Population pyramid of the local authorities within the Study Area from 2022 to 2047 (Ref 14-19)

- 14.4.28 The future baseline for residential properties, businesses, community facilities, open spaces, visitor attractions and development land over the medium to longer-term is uncertain beyond where allocated and planned development sites have been identified. Due to this uncertainty, it is assumed the future baseline for the Study Area would be unchanged from the current baseline to the completion of the Proposed Development, except where new development is expected to be delivered in line with allocated and planned development sites as set out above.

14.5 Identification of Potential Effects

- 14.5.1 The assessment will consider the construction, and operational phases of the Proposed Development, as described in Chapter 3. The scope of the assessment has been determined in line with the approach set out in Chapter 4 and will take into account embedded design and management measures. Potential impact pathways have been reviewed to identify where significant effects may arise on receptors within the Study Area. These have been scoped in or out of the assessment based on their likelihood to result in significant effects.
- 14.5.2 The decommissioning of the Proposed Development has been scoped out of the socioeconomic assessment.
- 14.5.3 Table 14-10 sets out the receptors considered at a project-wide level, the relevant project phase, the nature of the potential impact, and whether the effect is proposed to be scoped in or out of the assessment. Impacts to any PRow are considered within Chapter 8: Traffic and Movement.

Table 14-13: Overview of Potential Impacts

Receptor	Project Phase	Impact	Potential for Significance	Proposed to be scoped in / out
The local labour market	Construction	Potential employment and training benefits within the local labour market, including supply chain opportunities, as well as opportunities for training and skills development.	Yes – the Proposed Development will generate beneficial direct and indirect temporary employment, training and apprenticeship opportunities both on site and indirectly in the supply chain during the construction phase, which could be significant.	Scoped in
The local labour market	Operation	Potential employment and training benefits across the supply chain.	Yes – government policy means cement and lime sites cannot operate indefinitely without decarbonisation, and CCS is the only viable route. The Proposed Development enables continued operation of these sites, preventing job losses in the local labour market, so operational impacts are scoped in.	Scoped in
Development land, utilities and renewables infrastructure	Construction	Potential temporary or permanent loss of development land.	Yes – the Proposed Development has been designed to avoid development land, utilities and renewables infrastructure as far as possible, however there may be the potential for land take which could result in the potential for significant effects and so this has been scoped in for further consideration at this stage.	Scoped in
Development land, utilities and renewables infrastructure	Operation and Maintenance	Potential temporary or permanent loss of development land.	No – any temporary or permanent effects on development land, utilities and renewables infrastructure would arise during the construction period and would therefore be assessed as construction effects. No significant effects on development land are anticipated during operation. Disruption to development land during maintenance will be avoided as far as possible and it is not considered that there is the potential for significant effects	Scoped out
Open Space	Construction	Potential temporary loss of open space.	Yes – the Proposed Development has been designed to avoid open space as far as possible, however, there may be the potential for	Scoped in

Receptor	Project Phase	Impact	Potential for Significance	Proposed to be scoped in / out
			land take which could result in the potential for significant effects and so this has been scoped in for further consideration at this stage.	
Open Space	Operation and maintenance	Potential permanent loss of open space.	Yes – the Proposed Development has been designed to avoid open space as far as possible, however, there may be the potential for land take (e.g. for AGIs) which could result in the potential for significant effects and so this has been scoped in for further consideration at this stage.	Scoped in
Affected communities, community facilities, visitor attractions and businesses	Construction	Potential temporary or permanent loss of or impact on receptors (direct effects)	Yes – the Proposed Development has been designed to avoid direct effects on these receptors as far as possible. However, there is the potential for indirect temporary effects to arise from construction activities that may give rise to significant effects, so this has been scoped in for further consideration at this stage.	Scoped in
Affected communities, community facilities, visitor attractions and businesses	Construction, operation and maintenance	Potential temporary or permanent loss of or impact on receptors (direct effects)	No - the Proposed Development has been designed to avoid significant adverse effects on affected communities, community facilities, visitor attractions, and businesses as far as possible, particularly through careful route selection and design evolution	Scoped out
Tourism Accommodation	Construction	Potential for impacts on the availability of tourism accommodation due to use by the construction	Yes – impact of the construction workforce on bedspace availability is scoped in due to the potential scale of employment generated during the construction phase and the cumulative impact of other projects in the region.	Scoped in

Receptor	Project Phase	Impact	Potential for Significance	Proposed to be scoped in / out
		workforce (indirect effects).		
Tourism Accommodation	Operation and maintenance	Potential for impacts on the availability of tourism accommodation due to use by the construction workforce (indirect effects).	Yes – impact of the construction workforce on bedspace availability is scoped in due to the potential scale of employment generated during the construction phase and the cumulative impact of other projects in the region.	Scoped in
Residential Properties	Construction	Potential temporary or permanent loss of residential property, access and impact on amenity (direct or indirect effects).	Yes – the Proposed Development has been designed to avoid significant adverse effects on residential properties but there may be some unavoidable effects, such as proximity to construction activities, temporary land take, or changes in access.	Scoped in
Residential Properties	Operation and maintenance	Potential temporary or permanent loss of residential property, access and impact on amenity (direct or indirect effects).	No - the Proposed Development has been designed to avoid significant adverse effects on residential properties as far as possible, particularly through careful route selection and design evolution.	Scoped out

14.6 Planned Surveys

- 14.6.1 No primary baseline data collection surveys are anticipated to be required for the completion of the socio-economics assessment. It is important to note however, that information gathered during consultation will be used as appropriate to help inform the scope of the assessment.

14.7 Scope and Methodology

- 14.7.1 The overall assessment methodology for the EIA is outlined in Chapter 4: EIA Approach and Methodology. For the socio-economics chapter, a desk-based baseline assessment will be undertaken using established statistical sources and relevant stakeholder engagement. This will describe socio-economic conditions across the geographical areas, across the Study Area. A review of relevant policy at local, regional, and national levels will also continue to be undertaken to identify key issues of relevance to the Proposed Development.
- 14.7.2 As there is limited technical guidance specific to socio-economic assessment, the methodology will follow standard EIA principles. This includes evaluating the likely scale, permanence, and significance of effects on socio-economic receptors, as well as assessing potential cumulative impacts with other developments in the surrounding area.
- 14.7.3 The significance of effects will be determined by considering two key factors: the sensitivity of the receptor and the magnitude of the impact. Sensitivity reflects the vulnerability, recoverability, and importance of a receptor, while magnitude considers the scale, spatial extent, duration, and frequency of change from the baseline condition.
- 14.7.4 Table 14-14 and Table 14-15 set out the criteria for receptor sensitivity and impact magnitude, respectively. These criteria will be used to inform the significance of effects, which will be guided by a significance matrix (Table 14-16). While the matrix provides a structured framework, professional judgment supported by evidence will be applied to determine whether effects are considered major, moderate, minor, or negligible.
- 14.7.5 In general, major and moderate effects are considered significant, while minor and negligible effects are considered not significant. A classification of effects will be provided to support interpretation and decision-making, with reference to accepted thresholds, planning policy, and the value of affected receptors.

Sensitivity

- 14.7.6 Table 14-14 sets out the sensitivity criteria that will be used in the assessment. The sensitivity of a receptor is judged by its vulnerability of change and ability to recover from that change. Characterisation of the receptor is achieved by balancing out these key factors:
- *Vulnerability* – the vulnerability of the receptor relates to its capacity to accommodate change i.e. the tolerance/intolerance of the receptor to change.
 - *Recoverability* – the ability of the receptor to return to the baseline state.
 - *Importance* – the importance of the receptor or feature is a measure of the value assigned to that receptor based on biodiversity and ecosystem services, social value and economic value. Importance of the receptor is also defined within a geographical context, whether it is important internationally, nationally or locally.

Table 14-14: Sensitivity of receptors

Receptor type	Study Area for direct effects
Very high	Receptors possessing very significant economic, social and/or community value. These receptors are considered very likely to incur a material loss or gain as a result of potential changes, with little to no potential for substitution.
High	Receptors possessing some significant economic, social and/or community value. These receptors are considered likely to incur some material loss or gain as a result of potential changes, with limited potential for substitution.
Medium	Receptors possessing some economic, social and/or community value. These receptors are considered likely to incur a material loss or gain as a result of potential changes, with potential for substitution.
Low	Receptors possessing some economic, social and/or community value. These receptors are not considered likely to incur any loss or gain as a result of potential.
Negligible	Receptors possessing limited economic, social and/or community value. These receptors are not considered likely to incur any loss or gain as a result of potential changes.

Magnitude

14.7.7 Table 14-15 sets out the magnitude criteria that will be used in the assessment. Characterisation of the receptor is achieved by balancing out these key factors:

- *Scale of change* – the scale of change refers to the degree of change to or from the baseline environment caused by the impact being described.
- *Spatial extent* – the spatial extent is the full area over which the impact occurs.
- *Duration and frequency* – the duration is a measure of how long the impact is expected to last. Frequency refers to how often the impact would occur; it may be continuous or periodic.

Table 14-15: Magnitude of impact

Level of Magnitude	Description
Large	An impact that would likely result in total loss or improvement of the baseline condition resulting in the fundamental change of a receptor.
Medium	An impact that would be very likely to result in partial changes to baseline conditions altering the character of a receptor but not fundamentally.
Small	An impact that would be likely to result in minor changes to baseline conditions for a receptor
Negligible	An impact that would be likely to result in little or no change to baseline conditions.

Significance

- 14.7.8 Table 14-16 sets out the significance criteria that will be used in the assessment.
- 14.7.9 Together magnitude and sensitivity will inform the significance of the impact. In some cases, there may be large changes in a receptor however little to no significance. The Matrix is a tool to help in judging significance. However professional judgment supported by evidence is still required to justify the point at which an impact is considered major, moderate, minor or negligible. Generally, impacts found to be Moderate, or Major are considered 'significant' whilst minor or Negligible impacts are considered 'not significant'.

Table 14-16: Significance of Impact

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

Classification of effects

Table 14-17: Classification of Effects

Significance	General Criteria	Significant Effect
Major	A large and detrimental change to a valuable/sensitive receptor; likely exceeding an accepted (often legal) threshold. A large and beneficial change, resulting in improvements to the baseline or a major contribution being made to national targets. These effects may represent key factors in the decision-making process. Potentially associated with sites and features of international and national importance or likely to be important considerations at a regional or district scale. Major effects may relate to resources or features that are unique and which, if lost, cannot be replaced or relocated.	Yes
Moderate	A medium scale change that, although not beyond an accepted threshold, is still considered to be generally unacceptable, unless balanced out by other significant positive benefits of a project. Likely to be in breach of planning policy, rather than legal statute. These effects, if adverse, are likely to be important at a regional scale	Yes (typically)

Significance	General Criteria	Significant Effect
	and on their own could have a material influence on decision making. A positive moderate effect is a medium scale change that is significant in that the baseline conditions are improved to the extent that guideline targets (e.g. UK BAP targets) are contributed to.	
Minor	A small change that, whilst adverse, does not exceed legal or planning policy thresholds. A small positive change, but not one that is likely to be a key factor in the overall balance of issues. These effects may be raised as local issues and may be of relevance in the detailed design of a project but are unlikely to be critical in the decision-making process.	No
Negligible	A very small change that is so small and unimportant that it is considered acceptable to disregard. Effects which are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error, these effects are unlikely to influence decision making, irrespective of other effects.	No

Proposed Scope of Assessment

14.7.10 It is considered that the socio-economic topics summarised in Table 14-18 should be scoped in and out of the EIA.

Table 14-18: Proposed Scope of Socio-economics Assessment

Receptor	Potential for Significance	Project Phase	Scope
Local labour Market	Construction of the Project is expected to create employment, training, and apprenticeship opportunities for residents. In the absence of this project, there is a risk that current sites may close, potentially increasing unemployment in local labour markets.	Construction	Scoped in
		Operation	Scoped in
		Decommissioning	Scoped out
Development land, utilities and renewables infrastructure	The Scoping Boundary allows flexibility for the final route to avoid development land, utilities, and renewable energy infrastructure as far as possible. However, there may be potential for land take within current development allocations. Any temporary or permanent effects on land allocated for development by local plans would arise during the construction period and would therefore be assessed as construction effects. Disruption during	Construction	Scoped in
		Operation	Scoped out
		Decommissioning	Scoped out

Receptor	Potential for Significance	Project Phase	Scope
	operation and maintenance will be avoided as far as possible.		
Open Space	There may be potential for the need to take land classified as open space. Any temporary or permanent effects would be assessed during both construction and operation.	Construction	Scoped in
		Operation	Scoped in
		Decommissioning	Scoped out
Affected Communities, Community facilities, visitor attractions and businesses - indirect effects	The Scoping Boundary allows flexibility for the final route to avoid acquisition or over-sail of these receptors.	Construction	Scoped in
		Operation	Scoped out
		Decommissioning	Scoped out
Tourism Accommodation	Due to the potential scale of construction employment in the region, potential impacts on tourism bedspace availability are scoped in during construction. It is anticipated that accommodation availability will be unaffected during operation and maintenance due to the smaller scale of employment.	Construction	Scoped in
		Operation	Scoped out
		Decommissioning	Scoped out
Residential properties – direct and indirect effects	The Scoping Boundary allows flexibility for the final route to avoid acquisition or over-sail of residential properties. Indirect effects such as access and noise will be managed to reduce the potential for significant effects.	Construction	Scoped in
		Operation	Scoped out
		Decommissioning	Scoped out

14.8 Assumptions and Limitations

- 14.8.1 This chapter of the Scoping Report has been collated based on a range of publicly available data and information only. It is assumed that the data collated is accurate. The baseline will be supplemented with additional data collected as part of the EIA process. A precautionary approach has been taken and professional judgement, based on experience of similar projects, has been used where required to inform the scope of the assessment.
- 14.8.2 Information on open space will be drawn from desk-based research using OS data and checked against Google Maps. This may not capture the most comprehensive or up to date information, and therefore, the list of baseline open spaces should be viewed as indicative rather than a comprehensive assessment. A more detailed baseline will be provided as part of the ES, drawing on information provided through consultation and stakeholder engagement.
- 14.8.3 A proportion of the construction and maintenance workers are likely to live locally to the site, while a proportion will travel to the site to work. More detail on the average and peak number of

workers expected to work across the construction and maintenance period, and the proportion of workers who will be expected to live locally to the site, will become available as the Proposed Development progresses and will be set out in the ES, also taking into account other developments taking place or planned locally. This will inform the assessment of construction employment effects.

14.9 Conclusion

Summary

- 14.9.1 This chapter of the Scoping Report has set out the proposed scope and methodology for the ES assessment of socio-economic effects arising from the construction, operation, maintenance and decommissioning of the Proposed Development.
- 14.9.2 The next steps for the socio-economics assessment are:
- Mapping of receptors including recreational routes, development land utilities and renewables, open space, communities, community facilities, visitor attractions and businesses, Tourism accommodation and residential properties.
 - Engagement with affected stakeholders, including representatives of businesses and community facilities that could be directly impacted, to understand potential adverse impacts and develop appropriate mitigation.
 - Updates to baseline, drawing on published data sources, online mapping and information received through stakeholder engagement and consultation.
 - Review and identify appropriate mitigation to reduce likely significant effects. This will be carried out in coordination with other topics including noise and vibration, air quality, landscape and visual, traffic and transport and health.

14.10 References

- Ref 14-1.** Homes & Communities Agency (2014). Additionality Guide: Fourth Edition. London: Homes & Communities Agency. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/378177/additionality_guide_2014_full.pdf
- Ref 14-2.** HM Government (1981). Town and Country Planning (Minerals) Act 1981. Available at: <https://www.legislation.gov.uk/ukpga/1981/12>
- Ref 14-3.** The UK's Modern Industrial Strategy (2025). Available at: https://assets.publishing.service.gov.uk/media/68595e56db8e139f95652dc6/industrial_strategy_policy_paper.pdf
- Ref 14-4.** West Midlands Combined Authority (2019). Regional Energy Strategy. Available at: <https://www.wmca.org.uk/what-we-do/environment-energy/energy-capital/policy/regional-energy-strategy>
- Ref 14-5.** East Midlands Combined County Authority (2019). East Midlands Vision for Growth. Available at: <https://www.eastmidlands-cca.gov.uk/what-we-do/the-economy/vision-for-growth/>

- Ref 14-6.** Net Zero North West Cluster Plan. Available at: <https://www.netzeronw.co.uk/north-west-cluster#documents>
- Ref 14-7.** Derbyshire Dales Local Plan Review. Available at: <https://dev2.derbyshiredales.gov.uk/planning/planning-policy-and-local-plan/local-plan/local-plan-review-2022>
- Ref 14-8.** High Peak Borough Council (2025). Growth Strategy 2025–2028. Available at: <https://democracy.highpeak.gov.uk/documents/s46777/Growth%20Strategy%20Draft%20-%20May%202025.pdf>
- Ref 14-10.** Cheshire East Local Plan (201-2030). Available at: <https://www.cheshireeast.gov.uk/planning/spatial-planning/cheshire-east-local-plan/cheshire-east-local-plan.aspx>
- Ref 14-11.** Cheshire West and Chester Local Plan. Available at: <https://www.cheshirewestandchester.gov.uk/your-council/policies-and-performance/council-plans-policies-and-strategies/planning-policy/local-plan>
- Ref 14-12.** Wirral Local Plan (2022–2040). Available at: <https://www.wirral.gov.uk/planning-and-building/local-plans-and-planning-policy/wirrals-development-plan/wirral-local-plan>
- Ref 14-13.** Staffordshire Moorlands Local Plan. Available at: <https://www.staffsmoorlands.gov.uk/localplan>
- Ref 14-14.** Office for National Statistics (2021). Census 2021. Available at: <https://www.ons.gov.uk/census>
- Ref 14-15.** Office for National Statistics (2023). UK Business Register and Employment Survey. Available at: <https://www.nomisweb.co.uk/datasets/newbres6pub>
- Ref 14-16.** Office for National Statistics (2024). Mid-year population estimates. Available at: <https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates>
- Ref 14-17.** Ministry of Housing, Communities & Local Government (2019). English Indices of Deprivation 2019. Available at: <https://www.gov.uk/government/statistics/english-indices-of-deprivation-2019>
- Ref 14-18.** Office for National Statistics (2025). Regional Gross Value Added (balanced) per head and income components. Available at: <https://www.ons.gov.uk/economy/grossvalueaddedgva>
- Ref 14-19.** Office for National Statistics (2025). Population projections. Available at: <https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationprojections>
- Ref 14-20.** VisitBritain (2019). England Domestic Tourism. Available at: <https://www.visitbritain.org/england-domestic-tourism>
- Ref 14-21.** VisitBritain (2016). England Accommodation Stock Audit. Available at: <https://www.visitbritain.org/accommodation-stock-audit>

Ref 14-22 Department for Energy Security & Net Zero (2025) Overarching National Policy Statement. Available at:

<https://assets.publishing.service.gov.uk/media/68093d68148a9969d2394f59/draft-nps-en-1.pdf>

Ref 14-23 Peak District National Park (2011) Peak District National Park Local Development Framework. Available at: <https://www.peakdistrict.gov.uk/planning/policies-and-guides/core-strategy>

15. Human Health

15.1 Introduction

- 15.1.1 This chapter of the Scoping Report presents an initial baseline for human health effects which may arise from the Proposed Development. The chapter identifies the need for additional surveys to ensure we have appropriate information to accurately characterise the baseline and sets out the Study Area. In addition, the chapter provides an overview of the assessment methodology to be followed for the environmental assessment and identifies the potential effects.

15.2 Legislation, Policy and Guidance

- 15.2.1 Further to the legislation and policy presented in Chapter 2, the following additional policy and legislation relevant to the human health assessment have been summarised in the table below.

Table 15-1: Legislation and Policy Relevant to Human Health

Legislation and Policy
Health and Safety at Work etc. Act 1974 (Ref. 13 1)
Environmental Protection Act 1990 (Ref. 13 2)
Clean Air Act 1993 (Ref. 13 3)
Environment Act 1995 (Ref. 13 4)
Countryside and Rights of Way Act 2000 (Ref. 13 5)
Health Protection (Notification) Regulations 2010 (Ref. 13 6)

- 15.2.2 The human health assessment will be carried out in accordance with best practice guidance, as described below.

Table 15-2: Guidance Relevant to Human Health

Guidance
<i>National Planning Practice Guidance (NPPG)</i> (Ref. 13 7) provides additional guidance to the NPPF. Of particular relevance to health is the section on 'Achieving healthy and inclusive communities', which sets out how the design and use of the built and natural environment are key determinants of health and wellbeing, and how positive planning can contribute to healthier communities.
<i>Institute of Environmental Management and Assessment (IEMA) Guide to: Effective Scoping of Human Health in Environmental Impact Assessment 2022</i> (Ref. 13 8) provides information on determining the relevant health issues that should be included in EIAs by those responsible for the commissioning, conducting, or reviewing or EIAs. The guide emphasises the need to take a holistic approach to health, considering physical, mental and social dimensions of health, as well as health inequalities.
<i>IEMA Guide to: Determining Significance for Human Health in EIA Guidance 2022</i> (Ref. 13-9) presents a framework that should be used by EIA practitioners to identify, describe, and assess the direct and indirect significant effects of a proposed development on human health. It defines significance as informed expert judgement of the importance,

Guidance

desirability, or acceptability of a change, which must be evidence-based and explained within context.

Public Health England (PHE) Spatial Planning for Health: An Evidence resource for designing healthier places 2017 (Ref. 13-10) provides public health planners and local communities with evidence informed principles for designing healthy places. The review addresses the relationship which exists between public health and the built environment. It identifies five aspects of the built and natural environment which can be influenced by local planning policy:

- Neighbourhood design;
- Housing;
- Healthier Food;
- Natural and sustainable environment; and
- Transport.

For each aspect identified above, the review provides the evidence base underpinning why they are important determinants of public health. It also sets out principles which public health professionals and planners should follow to ensure healthier places.

The two aspects deemed most relevant to the Proposed Project are 'neighbourhood design' and 'natural and sustainable environment'. For 'neighbourhood design', the review states that "Neighbourhoods are places where people live, work, and play and have a sense of belonging. The design of a neighbourhood can contribute to the health and well-being of the people living there. Several aspects of neighbourhood design (walkability and mixed land use) can also maximise opportunities for social engagement and active travel. Neighbourhood design can impact on our day-to-day decisions and therefore have a significant role in shaping our health behaviours" (pg. 11).

For the 'natural and sustainable environment', the review states "there is a very significant and strong body of evidence linking contact and exposure to the natural environment with improved health and wellbeing. For the purpose of this review, the natural and sustainable environment is comprised of neighbourhood ecosystems and the resulting co-benefits between the environment and health. Protecting the natural environment is essential to sustaining human civilization" (pg. 38).

PHE Strategy 2020 to 2025 (Ref. 13 11) states PHE's objectives over the five-year period. Relevant priorities within the strategy include:

- a. Healthier diets, healthier weights: help make the healthy choice the easy choice to improve diets and rates of childhood obesity;
- b. Cleaner air: develop and share advice on how best to reduce air pollution levels and people's exposure to polluted air; and
- c. Better mental health: promote good mental health and contribute to the prevention of mental illness

The Marmot Review: Fair Society Healthy Lives (2010) (Ref. 13 12) argued that serious avoidable health inequalities exist across England and shows these inequalities to be determined by a wide range of socio-economic factors.

The Review identifies policy objectives including the following of relevance to the Proposed Project:

Guidance
a. Create fair employment and good work for all; b. Ensure a healthy standard of living for all; c. Create and develop healthy and sustainable places and communities; and d. Strengthen the role and impact of ill health prevention.
<i>Health Equity in England: The Marmot Review 10 Years On (2020)</i> (Ref. 13 13) highlighted the growth in health inequality over the preceding 10 years, especially for those living in more deprived districts and regions. The report calls upon the Government to make health and wellbeing a central policy goal which will in turn create a better society, with better health and health equity.
<i>Build Back Fairer: The Covid-19 Marmot Review (2020)</i> (Ref. 13 14) provides an update to the Marmot Review 10 Years on report to investigate how the pandemic has affected health inequalities in England. The Covid-19 pandemic exposed and amplified some of the inequalities highlighted in the Marmot Review 10 Years On report.
<i>NHS 10 Year Health Plan for England: Fit for the future (2025)</i> (Ref. 13 15) sets out a ten-year programme of strategic transformation across the health service. The plan outlines how the NHS will further its efforts to tackle health inequalities through an increased emphasis on preventative healthcare, digital innovation, and targeted investment in underserved communities. Key priorities include expanding access to mental health services, strengthening integrated local care systems, and supporting initiatives that address the wider determinants of health, such as housing, nutrition, and environmental factors including air quality and climate resilience.

15.3 Defining the Study Area

- 15.3.1 The Study Area for human health varies depending on the effect or type of resource being assessed.
- 15.3.2 At present, a wide spatial area definition applies for consideration in the human health assessment. This includes the Scoping Boundary, along with the surrounding areas based on administrative boundaries to align with how the Government publishes official data and the boundaries of health service planning areas, which are typically at district / unitary level.
- 15.3.3 The Study Area also reflects those defined by other environmental aspects relevant to human health, including:
- Chapter 5: Air Quality;
 - Chapter 7: Landscape and Visual;
 - Chapter 8: Traffic and Movement;
 - Chapter 9: Noise and Vibration;
 - Chapter 11: Water Environment and Flood Risk;
 - Chapter 16: Materials and Waste;
 - Chapter 17: Climate Change; and
 - Chapter 18: Major Accidents and Disasters.

- 15.3.4 For the purposes of the baseline conditions section of this chapter, the local authorities' areas through which the Proposed Development is aligned are regarded as 'the Study Area', and the data for this area is compared to the region and England as a whole. The Study Areas for the different elements of the Proposed Development are as they relate to local authorities; these are set out in Table 15-3.

Table 15-3: Study Area

Key Component of the Proposed Development	High Peak Borough Council	Staffordshire Moorlands District Council	Derbyshire Dales District Council	Peak District National Park Authority	Cheshire East Council	Cheshire West and Chester Council	Wirral Council
Breedon Capture Facility	✓		✓	✓			
Tarmac Capture Facility	✓						
Buxton Lime Capture Facility	✓						
Holcim Capture Facility		✓					
Peak Cluster Pipeline (East)	✓	✓	✓	✓	✓		
Peak Cluster Pipeline (Central)					✓	✓	
Peak Cluster Pipeline (West)						✓	✓
Coastal AGI to MLWS Pipeline							✓

- 15.3.5 For the Capture Facilities of the Proposed Development, an additional Study Area is presented as part of the baseline environment in this chapter, which provides more detailed context of the localised context around the immediate surrounding area of this site. This local Study Area is defined as the wards falling within, or up to 500 m from, the Scoping Boundary.
- 15.3.6 Existing and future land use receptors (such as residential properties, open space and recreational assets) will in general consider receptors within, and up to 500 m from, the Scoping Boundary.

15.4 Baseline Environment

- 15.4.1 An initial study of the baseline environment has been undertaken through desk-based research and is presented in Table 15-4 to Table 15-9.
- 15.4.2 The baseline environment provides a description of the key human health information within the Study Area against which the potential change arising from the Proposed Development will be assessed. Health indicators in the Study Area are compared with the local authority, regional and national averages.

15.4.3 Key sources of information for the human health assessment include:

- Office for National Statistics (ONS) 2021 Census Data (Ref. 13 16);
- ONS Annual Population Survey (July 2024 to June 2025) (Ref. 13 17);
- ONS Claimant Count: September 2025 (Ref. 13 18);
- Department of Health & Social Care (2025) Local health, public health data for small geographic areas (Ref. 13 19); and
- ONS (2022) National population projections: 2022-based (Ref. 13 20).

Table 15-4: Human Health Baseline Environment - Breedon Capture Facility

Baseline
The Breedon Capture Facility is located at the Breedon cement production plant to the north of Bradwell village and south of Hope village and is accessed via Pindale Road. The following table sets out the key health indicators for this site. The table shows a large concentration of people aged 65 and over in the local wards (31%) and the local authorities (25%), in comparison the average across the East Midlands (20%) and England (18%). The unemployment rate is lower in the local authorities (2.1%) than in the East Midlands (3.1%) and England (3.4%). This is also true for the share of claimants, with a rate of 1.5% in the local authorities, compared to 2.8% in the East Midlands and 3.2% across England. The percentage of the population in bad or very bad health in the wards of Hope Valley and Bradwell (5.2%) is comparable to the figures for the East Midlands (5.3%) and England (5.2%). The local authorities perform slightly better (4.8%). There is a higher concentration of persons considered to have a disability in the local wards (20.3%) than in any other comparable area (18.4% in the local authorities; 18.3% in the East Midlands and 17.3% in England). Life expectancy at birth is slightly higher in the local authorities than in the East Midlands and England. Child obesity is also noticeably lower in the local authorities (17.5%) than in the East Midlands and England (22.7%).

	Local ward(s)	Local Authority	Region	Country
	Hope Valley, Bradwell	High Peak, Derbyshire Dales	East Midlands	England
Population ONS Census, 2021	5,345	162,466	4,880,056	56,490,053
Population aged under 16 (%) ONS Census, 2021	12	16	18	19
Population aged 16 to 64 (%) ONS Census, 2021	57	60	62	63
Population aged 65 and over (%) ONS Census, 2021	31	25	20	18
Unemployment Rate (aged 16-64) (%) Annual Population Survey, Jul 2024-Jun 2025	N/A	2.1	3.1	3.4
Claimants (aged 16 and over) (%) ONS Claimant Count, September 2025	0.9	1.5	2.8	3.2
General health – Bad or Very Bad (%) ONS Census, 2021	5.2	4.8	5.3	5.2
Disabled under the Equality Act (%) ONS Census, 2021	20.3	18.4	18.3	17.3
Life expectancy at birth (Male) DHSC, Local health, public health data for small geographic areas, 2019-2023	N/A	80.0	78.9	79.1
Life expectancy at birth (Female) DHSC, Local health, public health data for small geographic areas, 2019-2023	N/A	83.8	82.6	83
Child obesity (%) DHSC, Local health, public health data for small geographic areas, 2021/22-2023/24	N/A	17.5	22.7	22.7

Sensitive receptors

There are health infrastructure receptors located within, and up to 500 m from, the Scoping Boundary. These include the Edale Mountain Rescue Team (on the site), Bradwell Surgery (in Bradwell) and Evelyn Medical Centre (in Hope).

There are two villages directly adjacent to the Scoping Boundary: Bradwell to the south of the site; Hope to the north of the site. A caravan park is located within 500 m of the Scoping Boundary (Eden Tree to the south-east of the site on Stretfield Road and Lanside Park to the north of the site on Station Road).

There is also the presence of employment activities directly within the Breedon Capture Facility area (Breedon Hope Cement), and to the east of the site (Brough Business Park).

There are several PROWs within, and up to 500m from, the Scoping Boundary, including:

- Footpath: WD17/6/3; WD17/6/2; WD17/5/2; WD17/5/1; WD17/3/1; WD17/46/1; WD17/3/2; WD17/9/2; WD17/10/2; WD17/32/1; HP16/7/1
- Bridleway: HP16/9/3

Future baseline

ONS population projections (2022-based) show that over the 20-year period from 2022 to 2042, the population across the High Peak and Derbyshire Dales Local Authority is expected to grow by 8.4% to approximately 176,594 people. This increase is lower than the projected rate of increase in the East Midlands (11.0%) and across England (10.8%) over the same period.

Due to uncertainty, as already identified in Table 15-4, it is assumed the future baseline for the Study Areas would be unchanged from the current baseline to the completion of the Proposed Development for the purpose of this assessment.

Table 15-5: Human Health Baseline Environment - Tarmac Capture Facility

Baseline

The Tarmac Capture Facility is located at the Tarmac cement production plant at Tunstead, located near Buxton in Derbyshire, south of Waterswallows Road. The Buxton Lime Capture Facility is also located at the Tunstead site and shares the same Scoping Boundary.

The following table sets out the key health indicators for this site.

This table shows that there is a larger concentration of people aged 65 and over in the local area (local ward(s)) and local authority, in comparison with the average across England.

The unemployment rate is lower in High Peak (2.0%) than in the East Midlands (3.1%) and England (3.4%). This is also true for the share of claimants, with a rate of 1.4% in Limestone Peak (ward) and 1.8% in High Peak, compared to 2.8% in the East Midlands and 3.2% across England.

Baseline

General health is also better in the ward of Limestone Peak, with 4.7% of the population considered to be in bad or very bad health (5.0% in High Peak), compared to the regional average of 5.3% and the national average of 5.2%.

Child obesity is also noticeably lower in High Peak (17.6%) than in the East Midlands and England (22.7%).

Despite good health indicators in the local ward and local authority, this does not translate into a higher life expectancy at birth when compared to the regional and national average.

	Local ward(s)	Local Authority	Region	Country
	Limestone Peak	High Peak	East Midlands	England
Population ONS Census, 2021	2,194	90,930	4,880,056	56,490,053
Population aged under 16 (%) ONS Census, 2021	17	17	18	19
Population aged 16 to 64 (%) ONS Census, 2021	63	61	62	63
Population aged 65 and over (%) ONS Census, 2021	20	22	20	18
Unemployment Rate (aged 16-64) (%) Annual Population Survey, Jul 2024-Jun 2025	N/A	2.0	3.1	3.4
Claimants (aged 16 and over) (%) ONS Claimant Count, September 2025	1.4	1.8	2.8	3.2
General health – Bad or Very Bad (%) ONS Census, 2021	4.7	5.0	5.3	5.2
Disabled under the Equality Act (%) ONS Census, 2021	17.1	18.4	18.3	17.3
Life expectancy at birth (Male) DHSC, Local health, public health data for small geographic areas, 2019-2023	N/A	79.2	78.9	79.1
Life expectancy at birth (Female)	N/A	82.7	82.6	83

	Local ward(s)	Local Authority	Region	Country
	Limestone Peak	High Peak	East Midlands	England
DHSC, Local health, public health data for small geographic areas, 2019-2023				
Child obesity (%) DHSC, Local health, public health data for small geographic areas, 2021/22-2023/24	N/A	17.6	22.7	22.7

Sensitive receptors

There are no health infrastructure receptors (hospitals and accident and emergency facilities) located within, and up to 500 m from, the Scoping Boundary. The closest health infrastructure receptors to the Tarmac Capture Facility are located in Buxton (over 3km to the west of the site), including several GP practices, health centres and Buxton Hospital.

There are a small number of community infrastructure receptors within, and up to 500 m from, the Scoping Boundary, including footpaths (HP24/19/1; HP24/20/1; HP24/19/2; HP13/3/1; HP24/51/3) and bridleways (HP24/52/3).

The settlement of Peak Dale is located to the north of the site, with some residential properties falling within 500 m of the Scoping Boundary.

Employment activities also take place on the Tarmac cement production site (and Buxton Lime production plant). Waterswallows Industrial Park is located to the north-west of the site and within 500m of the Scoping Boundary.

Future baseline

ONS population projections (2022-based) show that over the 20-year period from 2022 to 2042, the population across the High Peak Local Authority is expected to grow by 8.1% to approximately 98,515 people. This increase is lower than the projected rate of increase in the East Midlands (11.0%) and across England (10.8%) over the same period.

Due to the broad range of individual and environmental determinants that can influence physical and mental health outcomes, the future community health baseline over the medium-term is highly uncertain. Due to this uncertainty, for the purposes of this assessment, it is assumed the future baseline for the Study Areas would be unchanged from the current baseline to the completion of the Proposed Development.

Table 15-6: Human Health Baseline Environment - Buxton Lime Capture Facility

Baseline
The Buxton Lime Capture Facility is located at the Buxton Lime production plant at Tunstead, near Buxton in Derbyshire, south of Waterswallows Road. As aforementioned, the Buxton Lime and Tarmac Capture Facilities are within the same location and share the same Scoping Boundary. The following table sets out the key health indicators for this site, which is identical to the health indicators presented for Tarmac Capture Facility.

	Local ward(s)	Local Authority	Region	Country
	Limestone Peak	High Peak	East Midlands	England
Population ONS Census, 2021	2,194	90,930	4,880,056	56,490,053
Population aged under 16 (%) ONS Census, 2021	17	17	18	19
Population aged 16 to 64 (%) ONS Census, 2021	63	61	62	63
Population aged 65 and over (%) ONS Census, 2021	20	22	20	18
Unemployment Rate (aged 16-64) (%) Annual Population Survey, Jul 2024-Jun 2025	N/A	2.0	3.1	3.4
Claimants (aged 16 and over) (%) ONS Claimant Count, September 2025	1.4	1.8	2.8	3.2
General health – Bad or Very Bad (%) ONS Census, 2021	4.7	5.0	5.3	5.2
Disabled under the Equality Act (%) ONS Census, 2021	17.1	18.4	18.3	17.3
Life expectancy at birth (Male) DHSC, Local health, public health data for small geographic areas, 2019-2023	N/A	79.2	78.9	79.1
Life expectancy at birth (Female)	N/A	82.7	82.6	83

	Local ward(s)	Local Authority	Region	Country
	Limestone Peak	High Peak	East Midlands	England
DHSC, Local health, public health data for small geographic areas, 2019-2023				
Child obesity (%) DHSC, Local health, public health data for small geographic areas, 2021/22-2023/24	N/A	17.6	22.7	22.7

Sensitive receptors

Receptors within, and up to 500m from, the Scoping Boundary are the same as those presented for the Tarmac Capture Facility, presented in Table 13.4 so have not been repeated here.

Future baseline

The future baseline for Buxton Lime Capture Facility is identical to the one for Tarmac Capture Facility, presented in Table 15-4 so has not been repeated here.

Table 15-7: Human Health Baseline Environment- Holcim Capture Facility

Baseline

The Holcim Capture Facility is located at the Holcim cement production plant at Cauldon in Staffordshire, situated to the south of Waterhouses village and north of the Cauldon Quarry. The site is accessed via Earlsway. The following table sets out the key health indicators for this site. The table shows a large concentration of people aged 65 and over in the local area (local ward(s) and local authority, in comparison to the average across England. The unemployment rate is lower in Staffordshire Moorlands (2.3%) than in the West Midlands (3.9%) and England (3.4%). This is also true for the share of claimants, with a rate of 0.7% in Hamps Valley (ward) and 1.5% in Staffordshire Moorlands, compared to 4.2% in the West Midlands and 3.2% across England. The percentage of the population in bad or very bad health is also lower in the ward of Hamps Valley, in comparison to the regional and national figures. Staffordshire Moorlands however have a higher concentration of population in bad or very bad health compared to the regional and national figures.

This observation is also valid for the percentage of the population considered to have a disability, with the local ward having lower rates of disability than the West Midlands and England, but the local authority has higher rates than both the regional and national figures.

Life expectancy at birth is slightly higher in Staffordshire Moorlands than in the West Midlands and England.

Child obesity is also significantly lower in Staffordshire Moorlands (21.8%) than in the West Midlands (25.3%), and lower than the national average (22.7%).

Child obesity is also noticeably lower in High Peak (17.6%) than in the East Midlands and England (22.7%).

Baseline

Despite good health indicators in the local ward and local authority, this does not translate into a higher life expectancy at birth when compared to the regional and national average.

	Local ward(s)	Local Authority	Region	Country
	Hamps Valley	High Peak	East Midlands	England
Population ONS Census, 2021	1,744	95,851	5,950,764	56,490,053
Population aged under 16 (%) ONS Census, 2021	17	16	19	19
Population aged 16 to 64 (%) ONS Census, 2021	56	58	62	63
Population aged 65 and over (%) ONS Census, 2021	28	26	19	18
Unemployment Rate (aged 16-64) (%) Annual Population Survey, Jul 2024-Jun 2025	N/A	2.3	3.9	3.4
Claimants (aged 16 and over) (%) ONS Claimant Count, September 2025	0.7	1.5	4.2	3.2
General health – Bad or Very Bad (%) ONS Census, 2021	4.1	5.6	5.7	5.2
Disabled under the Equality Act (%) ONS Census, 2021	14.7	19.6	18.1	17.3
Life expectancy at birth (Male) DHSC, Local health, public health data for small geographic areas, 2019-2023	N/A	79.9	78.4	79.1
Life expectancy at birth (Female) DHSC, Local health, public health data for small geographic areas, 2019-2023	N/A	83.4	82.5	83
Child obesity (%) DHSC, Local health, public health data for small geographic areas, 2021/22-2023/24	N/A	21.8	25.3	22.7

Sensitive receptors

There are no health infrastructure receptors (hospitals and accident and emergency facilities) located within, and up to 500 m from, the Scoping Boundary. The closest health infrastructure receptor to the Holcim Capture Facility site is located in Waterhouses, about 900 m from the site (Waterhouses Medical Practice).

There are footpaths (PRoWs) within, and up to 500m from, the Scoping Boundary, including SF|Waterhouses CP|85; SF|Waterhouses CP|83; SF|Waterhouses CP|74; SF|Waterhouses CP|80; SF|Waterhouses CP|81; SF|Waterhouses CP|71(a).

Part of Waterhouses is located to the north of the site within, and up to 500 m from, the Scoping Boundary. Cauldon is also located within this catchment, to the west of the site. A small number of residential properties are within 500m of the Scoping Boundary.

Employment activities also take place directly on the site (Aggregate Industries) and to the north of the site (The Hawthorns), within 500 m of the Scoping Boundary.

Future baseline

ONS population projections (2022-based) show that over the 20-year period from 2022 to 2042, the population across the Staffordshire Moorlands Local Authority is expected to grow by 1.2% to approximately 97,079 people. This increase is lower than the projected rate of increase in the West Midlands (9.9%) and across England (10.8%) over the same period.

Due to uncertainty, as already identified in Table 15-7, it is assumed the future baseline for the Study Areas would be unchanged from the current baseline to the completion of the Proposed Development for the purpose of this assessment.

Table 15-8: Human Health Baseline Environment - Peak Cluster Pipeline (East)

Baseline

The following table sets out the key health indicators for the Pipeline East route.

The Pipeline East covers the section of pipeline east of the Central AGI station, including the links to the Capture Facilities and runs through four local authorities (High Peak, Derbyshire Dales, Staffordshire Moorlands, Cheshire East) and three regions (East Midlands, West Midlands, North West).

Local authorities along Pipeline East have a higher concentration of people aged 65 and over (23%) than the regions (19%) and England (18%).

They have a lower rate of unemployment (2.1%) than the regions (3.5%) and England (3.4%) as well as a lower rate of claimants (1.6%, compared to 3.5% across the regions and England).

General health is slightly better in the local authorities, than across the regions and England, with 4.9% considered to be in bad or very bad health, against 5.8% and 5.2% respectively.

Baseline

Child obesity is also lower (19%) than in the regions (23.9%) and England (22.7%).

Life expectancy at birth is slightly higher in the local authorities than across the regions and England.

	Local Authority	Region	Country
	High Peak, Derbyshire Dales, Staffordshire Moorlands, Cheshire East	East Midlands, West Midlands, North West	England
Population ONS Census, 2021	657,088	18,248,213	56,490,053
Population aged under 16 (%) ONS Census, 2021	17	19	19
Population aged 16 to 64 (%) ONS Census, 2021	60	62	63
Population aged 65 and over (%) ONS Census, 2021	23	19	18
Unemployment Rate (aged 16- 64) (%) Annual Population Survey, Jul 2024-Jun 2025	2.1	3.4	3.4
Claimants (aged 16 and over) (%) ONS Claimant Count, September 2025	1.6	3.5	3.2
General health – Bad or Very Bad (%) ONS Census, 2021	4.9	5.8	5.2
Disabled under the Equality Act (%) ONS Census, 2021	17.7	18.7	17.3
Life expectancy at birth (Male) DHSC, Local health, public health data for small geographic areas, 2019-2023	80.0	78.3	79.1
Life expectancy at birth (Female)	83.7	82.2	83

	Local Authority	Region	Country
	High Peak, Derbyshire Dales, Staffordshire Moorlands, Cheshire East	East Midlands, West Midlands, North West	England
DHSC, Local health, public health data for small geographic areas, 2019-2023			
Child obesity (%) DHSC, Local health, public health data for small geographic areas, 2021/22-2023/24	19.0	23.9	22.7

Sensitive receptors

A detailed baseline assessment of the existing human health receptors, along the length of the Pipeline East route, will be undertaken in the next stage of the assessment and presented within the PEIR and ES.

However, given the length of the Peak Cluster Pipeline, it is expected that a large number of sensitive receptors will be located within, and up to 500 m from, the pipeline corridor, including health infrastructure, community infrastructure, residential properties and settlements, and business activities.

Future baseline

ONS population projections (2022-based) show that over the 20-year period from 2022 to 2042, the population across the High Peak, Derbyshire Dales, Staffordshire Moorlands, Cheshire East Local Authorities is expected to grow by 13.9% to approximately 757,852 people. This increase is greater than the projected rate of increase in the East Midlands / West Midlands / North West combined (10.6%) and across England (10.8%) over the same period.

Due to uncertainty, as already identified in Table 15-4, it is assumed the future baseline for the Study Areas would be unchanged from the current baseline to the completion of the Proposed Development for the purpose of this assessment.

Table 15-9: Human Health Baseline Environment - Peak Cluster Pipeline (Central)

Baseline

The following table sets out the key health indicators for the Pipeline Central route.

The Pipeline Central covers the section of pipeline west of the Central AGI station, and east of the Connection AGI 2 including the links to the Capture Facilities and runs through two local authorities (Cheshire East, Cheshire West and Chester) and one region (North West).

Baseline

Local authorities on the Pipeline Central have a higher concentration of people aged 65 and over (22%) than the North West (19%) and England (18%).

They have a lower rate of unemployment (2.1%) than the North West (3.1%) and England (3.4%) as well as a lower rate of claimants (1.8%, compared to 3.2% in the North West and 3.4% in England.

General health is slightly better in the local authorities, than across the North West and England, with 5.0% considered to be in bad or very bad health, against 6.2% and 5.2% respectively.

Child obesity is also lower (19.6%) than in the North West (23.8%) and England (22.7%).

Life expectancy at birth is slightly higher in the local authorities than across the North West and England.

	Local Authority	Region	Country
	Cheshire East, Cheshire West and Chester	North West	England
Population ONS Census, 2021	755,921	7,417,393	56,490,053
Population aged under 16 (%) ONS Census, 2021	17	19	19
Population aged 16 to 64 (%) ONS Census, 2021	61	63	63
Population aged 65 and over (%) ONS Census, 2021	22	19	18
Unemployment Rate (aged 16-64) (%) Annual Population Survey, Jul 2024-Jun 2025	2.1	3.1	3.4
Claimants (aged 16 and over) (%) ONS Claimant Count, September 2025	1.8	3.3	3.2
General health – Bad or Very Bad (%) ONS Census, 2021	5.0	6.2	5.2
Disabled under the Equality Act (%) ONS Census, 2021	17.7	19.4	17.3
Life expectancy at birth (Male)	79.9	77.6	79.1

Baseline			
DHSC, Local health, public health data for small geographic areas, 2019-2023			
Life expectancy at birth (Female) DHSC, Local health, public health data for small geographic areas, 2019-2023	83.6	81.6	83
Child obesity (%) DHSC, Local health, public health data for small geographic areas, 2021/22-2023/24	19.6	23.8	22.7

Sensitive receptors
A detailed baseline assessment of the existing human health receptors, along the length of the Pipeline Central route, will be undertaken in the next stage of the assessment – upon finalisation of the Peak Cluster Pipeline corridor route. However, given the length of the pipeline, it is expected that a large number of sensitive receptors will be located within, and up to 500m from, the pipeline corridor, including health infrastructure, community infrastructure, residential properties and settlements, and business activities.
Future baseline
ONS population projections (2022-based) show that over the 20-year period from 2022 to 2042, the population across the Cheshire East, Cheshire West and Chester Local Authorities is expected to grow by 16.9% to approximately 898,474 people. This increase is greater than the projected rate of increase in the North West (11.0%) and across England (10.8%) over the same period. Due to uncertainty, as already identified in Table 15-4, it is assumed the future baseline for the Study Areas would be unchanged from the current baseline to the completion of the Proposed Development for the purpose of this assessment.

Table 15-10: Human Health Baseline Environment - Peak Cluster Pipeline (West) and Coastal AGI to MLWS Pipeline

Baseline
The key health indicators for the Pipeline West and Coastal AGI to MLWS Pipeline route are set out below. The Pipeline West covers the section of pipeline west the Connection AGI 2 including the links to the operators and runs through two local authorities (Cheshire West and Chester, Wirral) and one region (North West). Local authorities on the Pipeline West have a higher concentration of people aged 65 and over (22%) than the North West (19%) and England (18%).

Baseline

They have a lower rate of unemployment (2.7%) than the North West (3.1%) and England (3.4%) as well as a lower rate of claimants (1.8%, compared to 3.2% in the North West and 3.4% in England).

General health is comparable in the local authorities and the North West, with 6.2% considered to be in bad or very bad health, but worse than across England (5.2%).

Child obesity is slightly lower (21.2%) than in the North West (23.8%) and England (22.7%).

Life expectancy at birth is slightly higher in the local authorities than across the North West, but marginally lower than across England.

	Local Authority	Region	Country
	Cheshire West and Chester, Wirral	North West	England
Population ONS Census, 2021	677,349	7,417,393	56,490,053
Population aged under 16 (%) ONS Census, 2021	18	19	19
Population aged 16 to 64 (%) ONS Census, 2021	61	63	63
Population aged 65 and over (%) ONS Census, 2021	22	19	18
Unemployment Rate (aged 16-64) (%) Annual Population Survey, Jul 2024-Jun 2025	2.7	3.1	3.4
Claimants (aged 16 and over) (%) ONS Claimant Count, September 2025	2.3	3.3	3.2
General health – Bad or Very Bad (%) ONS Census, 2021	6.2	6.2	5.2
Disabled under the Equality Act (%) ONS Census, 2021	20.5	19.4	17.3
Life expectancy at birth (Male) DHSC, Local health, public health data for small geographic areas, 2019-2023	78.6	77.6	79.1

	Local Authority	Region	Country
	Cheshire West and Chester, Wirral	North West	England
Life expectancy at birth (Female) DHSC, Local health, public health data for small geographic areas, 2019-2023	82.6	81.6	83
Child obesity (%) DHSC, Local health, public health data for small geographic areas, 2021/22-2023/24	21.2	23.8	22.7

Sensitive receptors

A detailed baseline assessment of the existing human health receptors, along the length of the Pipeline West route, will be undertaken in the next stage of the assessment and presented within the PEIR and ES.

However, given the length of the pipeline, it is expected that a large number of sensitive receptors will be located within, and up to 500m from, the pipeline corridor, including health infrastructure, community infrastructure, residential properties and settlements, and business activities. The baseline would be split further within the ES providing figures for each LPA as appropriate.

Future baseline

ONS population projections (2022-based) show that over the 20-year period from 2022 to 2042, the population across the Local Authority (Cheshire West and Chester, Wirral) is expected to grow by 10.3% to approximately 754,494 people. This increase is lower than the projected rate of increase in the North West (11.0%) and across England (10.8%) over the same period.

Due to uncertainty, as already identified in Table 15-4, it is assumed the future baseline for the Study Areas would be unchanged from the current baseline to the completion of the Proposed Development for the purpose of this assessment.

15.5 Identification of Potential Effects

15.5.1 Key aspects of the Proposed Development that may affect human health are presented below:

Construction and Decommissioning

- Potential changes to air quality, noise and vibration, landscape and visual amenity, and traffic and transport;
- Potential changes to noise and vibration;
- Potential changes to the accessibility of PRow, recreational routes, and active travel networks arising from severance;

- Potential impacts on access to local community services (including healthcare, education facilities, and open space) as a result of changes to population and access routes;
- Potential impacts on social cohesion and community identity as a result of severance and changes in population and landscape and visual amenity;
- Potential generation of employment and training opportunities;
- Potential impact on climate change mitigation (GHG emissions); and
- Potential changes in flood risk and water quality.

Operation

- Potential changes to air quality, noise and vibration, landscape and visual amenity, and traffic and transport (Capture Facilities, AGI's and Coastal AGI);
- Potential impacts on social cohesion and community identity as a result of severance and changes in population and landscape and visual amenity (Capture Facilities, AGIs and Coastal AGI);
- Potential changes in flood risk and water quality; and
- Potential radiation from EMFs associated with electricity infrastructure.

15.6 Scope and Methodology

15.6.1 This section outlines the scope and methodology that will be employed for assessing the likely significant effects associated with human health.

Scope

15.6.2 The human health assessment will consider the sources and impacts that could occur as a result of the construction, operation, and decommissioning of the Proposed Development.

15.6.3 The potential for the Proposed Development to result in potential effects described in this section takes into account the embedded mitigation measures described in Section 15.8.

15.6.4 The sources of impact during the construction phase that will be considered include:

- Potential changes to air quality, noise and vibration, landscape and visual amenity, and traffic and transport;
- Potential changes to the accessibility of PRow, recreational routes, and active travel networks arising from severance;
- Potential impacts on access to local community services (including healthcare, education facilities, and open space) as a result of (temporary) changes to population (i.e. construction workers temporarily moving to the area) and access routes;
- Potential impacts on social cohesion and community identity as a result of severance (for example from temporary diversions and closures of PRow and roads), and changes in population and landscape and visual amenity;
- Potential generation of employment and training opportunities;
- Potential mitigation of climate change (GHG emissions); and
- Potential changes in flood risk and water quality.

15.6.5 The sources of impact during the operational phase that will be considered include:

- Potential changes to air quality, noise and vibration, landscape and visual amenity, and traffic and transport;
- Potential changes to the accessibility of PRow, recreational routes, and active travel networks arising from severance;
- Potential impacts on access to local community services (including healthcare, education facilities, and open space) as a result of changes to population and access routes;
- Potential impacts on social cohesion and community identity as a result of severance and changes in population and landscape and visual amenity;
- Potential generation of employment and training opportunities;
- Potential impact on climate change mitigation (GHG emissions);
- Potential changes in flood risk and water quality;
- Potential radiation from Electro-Magnetic Fields (EMFs) associated with electricity infrastructure; and

15.6.6 The sources of impact during the decommissioning phase that will be considered are the same as those listed as sources during the construction phase.

Methodology

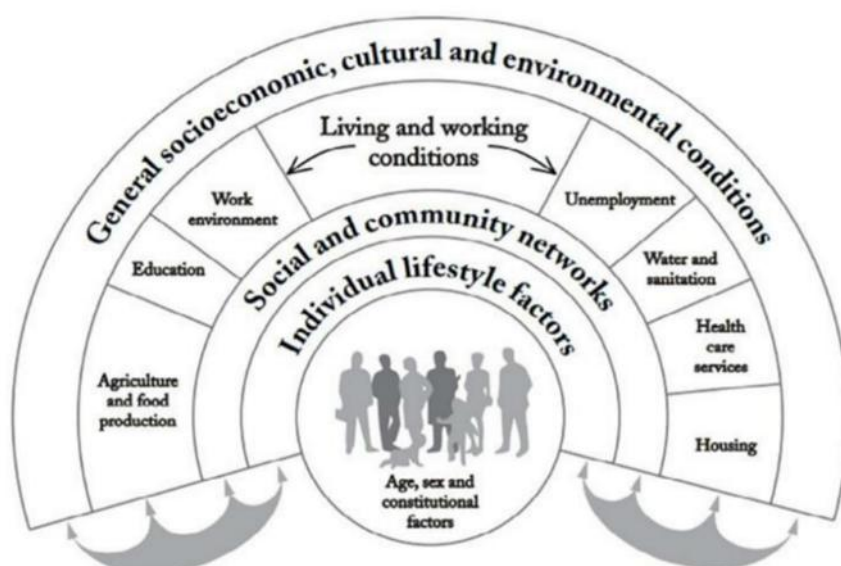
15.6.7 This section outlines the methodology that is proposed to be used for the human health assessment, building on the general assessment methodology presented in Chapter 4.

15.6.8 There is no consolidated methodology or practice for the assessment of effects on human health. Best practice principles are outlined in Table 15-2. The IEMA guidance 'Determining Significance For Human Health In Environmental Impact Assessment' (Ref. 13-9) will form the basis of the approach adopted to assess impacts on human health in this chapter.

15.6.9 The human health of individuals is determined by a broad range of individual constitutional and behavioural factors, as well as broader environmental, social and economic factors. Some factors are direct and obvious, others are indirect.

15.6.10 Dahlgreen and Whitehead's model (Ref. 13 21) of the main determinants of health, illustrates the breadth of possible influences on health, as show below.

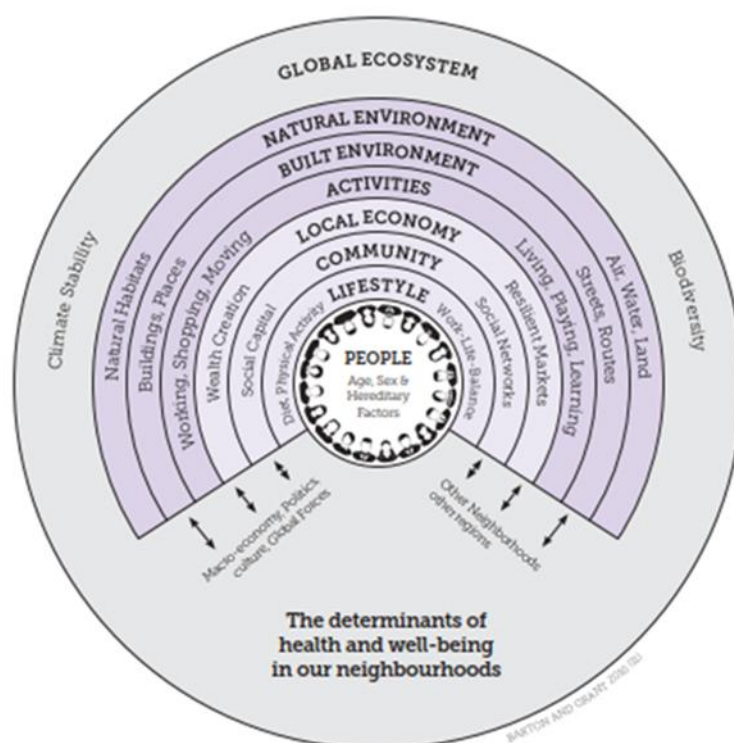
Plate 15-1: Determinants of health



Source: Dahlgreen and Whitehead (1993)

- 15.6.11 At the centre of the illustration are factors that are largely fixed, including individual age, sex, constitutional and genetic factors. Outside of this are factors generally described as the wider or broader determinants of health. The model emphasises interactions between the layers. Moving outwards from the centre, individual lifestyle choices are embedded in social norms and community networks, and in living and working conditions, which in turn are shaped by and related to the wider socioeconomic and cultural environment.
- 15.6.12 This model has been developed to show elements of the built environment and communities that are the key determinants of health, as shown in Plate 15-2. These determinants of health have informed the scope of the human health assessment.

Plate 15-2: Determinants of health in neighbourhoods



Source: Barton and Grant (2006) (Ref. 13 22)

15.6.13 Within a population there can also be health inequalities, defined by the WHO as “differences in health status or in the distribution of health determinants between different population groups. For example, differences in mobility between elderly people and younger populations or differences in mortality rates between people from different social classes” (Ref. 13 23). As discussed below, the assessment of human health effects therefore will consider the significance of effects in relation to vulnerable groups.

15.6.14 IEMA guidance (Ref. 13-9) considers the following health determinants of relevance to the assessment:

- Access to healthcare services and other social infrastructure;
- Access to open space, leisure and play;
- Air quality;
- Noise and vibration;
- Transport modes, access, connections and physical activity;
- Employment and income;
- Social cohesion and community identity;
- Climate change;
- Flood risk and water quality; and
- Radiation (Electro-magnetic fields)

15.6.15 The assessment will aim to quantify effects on human health as far as possible. However, some effects can only be evaluated on a qualitative basis. The classification and significance of an effect

reflects the relationship between the sensitivity of the affected receptor and the scale of impact (magnitude). As such, the significance of human health effects will be assessed based on expert judgement and professional experience, and relies on the following considerations:

- Sensitivity of human health receptors, including general populations and potentially vulnerable sub-populations: The assessment will take account of the qualitative sensitivity of relevant populations and sub-populations and their ability to respond to change as applicable to each determinant; and
- Magnitude of impact: This entails consideration of the scale of the exposure of the population to an impact; whether the impact is one-off or continuous; the likely nature of the impact; the permanence of the change; and the proportion of the relevant Study Area population that would be affected.

Sensitivity

15.6.16 The sensitivity of a population's human health is driven by a number of factors which are set out in Table 15-11 below and are based on guidance set out by ISEP (Ref. 13-8; Ref. 13-9).

Table 15-11: Human Health Sensitivity Criteria

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

Magnitude

15.6.17 Magnitude of impact is driven by a number of factors which are set out in Table 15-12 and are based on IEMA guidance (Ref. 13-9). Duration of effect is also considered, with more weight given to long-term or permanent changes than to shorter-term or temporary ones.

Table 15-12 Human Health Magnitude Impact Criteria

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

Significance

15.6.18 The significance of human health effects reflects the relationship between the sensitivity of the relevant population's health, and the magnitude of the impact, as set out in Table 15-13. Where two options are shown for the classification of effect (e.g. minor/negligible), professional judgement will be used to determine which of the two options is most appropriate.

Table 15-13 Human Health Significance of Effect

Magnitude of Impact	Sensitivity of Receptor			
	High	Medium	Low	Very Low
Large	Major	Major/ Moderate	Moderate/ Minor	Minor/ Negligible
Medium	Major/ Moderate	Moderate	Minor	Minor/ Negligible
Small	Moderate/ Minor	Minor	Minor	Negligible
Negligible	Minor/ Negligible	Minor/ Negligible	Negligible	Negligible

15.6.19 The following criteria is then applied to determine the significance of the effect:

- ‘Major’ or ‘Moderate’ effects are classified as ‘significant’;
- ‘Minor’ effects are classed as ‘not significant’, although they may be a matter of local concern; and
- ‘Negligible’ effects are classed as ‘not significant’

15.6.20 Where an impact is identified, actions will be proposed to mitigate any negative impact on health, or to realise opportunities to create health benefits. It should be noted that in many cases, mitigation will be embedded within the design of the Proposed Development, and the implementation of this will be an underlying assumption of the assessment.

Summary of issues to be scoped in / out

15.6.21 The following tables provide a summary of the issues to be scoped in / out in relation to the Capture Facilities and the Peak Cluster Pipeline, considering the construction phase, the operational phase and the decommissioning phase.

15.6.22 For each sub-topic, a rationale is provided to support the decision to scope in / out the potential impact.

Table 15-14: Human Health Scope- Capture Facilities

Human Health Scope- Capture Facilities				
Scope	Construction (C), Operation (O), Decommissioning (D)			Rationale
	C	O	D	
Scoped in ✓, scoped out ✗				
Potential changes to air quality, landscape and visual amenity, and traffic and transport.	✓	✓	✓	Construction / decommissioning of the Proposed Development (Capture Facilities) may impact human health through temporary /or permanent changes to air quality, landscape and visual amenity, and traffic and transport. Operation of the Proposed Development (Capture Facilities) may impact human health through permanent changes to air quality, landscape and visual amenity, and traffic and transport.

Human Health Scope- Capture Facilities				
Potential changes to noise and vibration.	✓	✓	✓	Construction / decommissioning of the Proposed Development (Capture Facilities) may impact human health through temporary noise and vibration. Operation of the Proposed Development (Capture Facilities) is not expected to impact human health through noise and vibration as plants are not expected to generate perceptible levels of noise and vibration and therefore there will be no associated operational effects. However, this will be assessed, based on effects identified by the Noise and Vibration chapter.
Potential changes to the accessibility of PRoW, recreational routes, and active travel networks arising from severance.	✓	✗	✓	Construction / decommissioning of the Proposed Development (Capture Facilities) may impact human health through temporary or permanent changes to the accessibility of PRoW, recreational routes, and active travel routes. Potential permanent impacts of operational effects associated with active travel networks, recreational access, connections, and physical activity have been scoped out of the assessment of human health. No PRoW are anticipated to be impacted during the operational phase.
Potential impacts on access to local community services (including healthcare, education facilities, and open space) as a result of changes to population and access routes.	✓	✗	✓	Construction / decommissioning of the Proposed Development (Capture Facilities) may impact human health through temporary /or permanent population changes and/or changes to the access of community services (including healthcare, education facilities, and open space). Potential permanent impacts of operational effects associated with access to local community services have been scoped out. No PRoW or road links / junctions are anticipated to be impacted during the operational phase. Additionally, the scale of operational employment is likely to be limited. Therefore, the impact of operational employment on community services and social infrastructure, including healthcare services, education facilities, and open space is scoped out of the assessment.
Potential impacts on social cohesion and community identity as a result of severance and	✓	✓	✓	Construction / decommissioning of the Proposed Development (Capture Facilities) may impact human health through temporary or permanent changes to social cohesion. Operation of the Proposed Development (Capture Facilities) may impact human health through

Human Health Scope- Capture Facilities				
changes in population and landscape and visual amenity.				permanent changes to social cohesion through changes to landscape and visual amenity.
Potential generation of employment and training opportunities.	✓	✗	✓	Construction / decommissioning of the Proposed Development (Capture Facilities) may impact human health through temporary or permanent effects of employment and training opportunities. In the absence of this project, there is a risk that current sites may close, potentially increasing unemployment in local labour markets
Potential impact on climate change through GHG emissions	✗	✓	✗	Construction and decommissioning activities are not likely to generate substantial GHG emissions. The Proposed Development will have a beneficial impact on climate change and GHG emissions by capturing and storing CO ₂ . This will be informed by findings of the Climate Change chapter.
Potential impact on flood risk and water quality	✓	✓	✓	Impact of the development on human health, related to increased risk of flooding and water quality will be assessed, and informed by the findings of the Water Environment and Flood Risk Chapter.

Table 15-15: Human Health Scope- Peak Cluster Pipeline and Coastal AGI to MLWS Pipeline(s)

Human Health Scope- Peak Cluster Pipeline and Coastal AGI to MLWS Pipeline(s)				
Scope	Construction (C), Operation (O), Decommissioning (D)			Rationale
	C	O	D	
Scoped in ✓, scoped out ✗				
Potential changes to air quality, landscape and visual amenity, and traffic and transport.	✓	✗	✓	Construction / decommissioning of the Proposed Development (Pipeline component) may impact human health through temporary /or permanent changes to air quality, landscape and visual amenity, and traffic and transport. No impacts expected on human health through permanent changes to air quality, landscape and visual amenity, and traffic and transport during the operation phase.
Potential changes to noise and vibration.	✓	✗	✓	Construction / decommissioning of the Proposed Development (Pipeline component) may impact human health through temporary noise and vibration.

Human Health Scope- Peak Cluster Pipeline and Coastal AGI to MLWS Pipeline(s)				
				No impacts are expected on human health through permanent changes to noise and vibration during the operation phase.
Potential changes to the accessibility of PRow, recreational routes, and active travel networks arising from severance.	✓	✗	✓	Construction / decommissioning of the Proposed Development (Pipeline component) may impact human health through temporary or permanent changes to the accessibility of PRow, recreational routes, and active travel routes. No impacts are expected on human health through permanent changes to the accessibility of PRow, recreational routes, and active travel routes during the operation phase.
Potential impacts on access to local community services (including healthcare, education facilities, and open space) as a result of changes to population and access routes.	✓	✗	✓	Construction / decommissioning of the Proposed Development (Pipeline component) may impact human health through temporary /or permanent population changes and/or changes to the access of community services (including healthcare, education facilities, and open space). No impacts are expected on human health through permanent population changes and/or changes to the access of community services during the operation phase.
Potential impacts on social cohesion and community identity as a result of severance and changes in population and landscape and visual amenity.	✓	✗	✓	Construction / decommissioning of the Proposed Development (Pipeline component) may impact human health through temporary or permanent changes to social cohesion. No impacts are expected on human health through permanent changes to social cohesion during the operation phase.
Potential generation of employment and training opportunities.	✓	✗	✓	Construction / decommissioning of the Proposed Development (Pipeline component) may impact human health through temporary or permanent effects of employment and training opportunities. The scale of operational employment is likely to be limited. Therefore, the impact of operational

Human Health Scope- Peak Cluster Pipeline and Coastal AGI to MLWS Pipeline(s)				
				employment and training opportunities on human health is scoped out.
Potential impact on climate change through GHG emissions	✗	✗	✗	Construction and decommissioning activities are not likely to generate substantial GHG emissions. During operation, whilst the pipeline will enable the transfer of CO ₂ for storage, this will not directly contribute to reducing CO ₂ emissions and contribute to the positive impact of the Capture Facilities.
Potential impact on flood risk and water quality	✓	✓	✓	Impact of the development on human health, related to increased risk of flooding and water quality will be assessed, and informed by the findings of the Water Environment and Flood Risk Chapter.
Potential impact of EMFs	✗	✓	✗	It is expected that mitigation measures will be embedded in the design of energy cabling (and their installation) necessary to the Proposed Development. However, an assessment of EMFs on human health will be carried out during the operation phase of the Proposed Development to ensure that potential negative impacts are mitigated.

Table 15-16: Human Health Scope- Coastal AGI and other AGIs

Human Health Scope- Coastal and other AGIs				
Scope	Construction(C), Operation (O), Decommissioning (D)			Rationale
	C	O	D	
Scoped in ✓, scoped out ✗				
Potential changes to air quality	✓	✗	✓	Construction / decommissioning of the Proposed Development (Coastal AGI and other AGI's) may impact human health through temporary changes to air quality (dust).
Potential changes to landscape and visual amenity	✓	✓	✓	Construction / operation / decommissioning of the Proposed Development (Coastal AGI and other AGIs) may impact human health through temporary and permanent changes to landscape and visual amenities
Potential changes to traffic and transport.	✓	✗	✗	Construction of the Proposed Development (Coastal AGI and other AGIs) may impact human health through temporary increase in traffic.

Human Health Scope- Coastal and other AGIs				
Potential changes to noise and vibration.	✓	✓	✓	Construction / operation / decommissioning of the Proposed Development (Coastal AGI and other AGIs) may impact human health through temporary and permanent noise and vibration.
Potential changes to the accessibility of PRoW, recreational routes, and active travel networks arising from severance.	✓	✗	✓	Construction / decommissioning of the Proposed Development may impact human health through temporary or permanent changes to the accessibility of PRoW, recreational routes, and active travel routes. No impacts are expected on human health through permanent changes to the accessibility of PRoW, recreational routes, and active travel routes during the operation phase.
Potential impacts on access to local community services (including healthcare, education facilities, and open space) as a result of changes to population and access routes.	✓	✗	✓	Construction / decommissioning of the Proposed Development may impact human health through temporary /or permanent population changes and/or changes to the access of community services (including healthcare, education facilities, and open space). No impacts are expected on human health through permanent population changes and/or changes to the access of community services during the operation phase.
Potential impacts on social cohesion and community identity as a result of severance and changes in population and landscape and visual amenity.	✓	✗	✓	Construction / decommissioning of the Proposed Development may impact human health through temporary or permanent changes to social cohesion. No impacts are expected on human health through permanent changes to social cohesion during the operation phase.
Potential generation of employment and training opportunities.	✓	✗	✓	Construction / decommissioning of the Proposed Development may impact human health through temporary or permanent effects of employment and training opportunities. The scale of operational employment is likely to be limited. Therefore, the impact of operational

Human Health Scope- Coastal and other AGIs				
				employment and training opportunities on human health is scoped out.
Potential impact on climate change through GHG emissions	✗	✗	✗	Construction and decommissioning activities are not likely to generate substantial GHG emissions.
Potential impact on flood risk and water quality	✓	✓	✓	Impact of the development on human health, related to increased risk of flooding and water quality will be assessed, and informed by the findings of the Water Environment and Flood Risk Chapter.
Potential impact of EMFs	✗	✓	✗	It is expected that mitigation measures will be embedded in the design of energy cabling (and their installation) necessary to the Proposed Development. However, an assessment of EMFs on human health will be carried out during the operation phase of the Proposed Development to ensure that potential negative impacts are mitigated.

15.7 Planned Surveys

- 15.7.1 No primary planned surveys are envisaged to inform the human health chapter. However, the assessment of impacts on human health will be informed by the findings of other technical chapters which would, where necessary include primary data collected via planned surveys.

15.8 Mitigation

- 15.8.1 Mitigation measures for the construction and operation and decommissioning phases of the Proposed Development include steps taken to influence its design to minimise likely significant effects based on key sensitivities, constraints, and opportunities identified as part of an iterative process of design and assessment (such as avoiding local receptors through design options).
- 15.8.2 Mitigation measures set out in other relevant technical chapters are also likely to be relevant for minimising effects on local receptors associated with human health.

15.9 Summary

- 15.9.1 Potential outcomes in regard to human health that could occur as a result of the Proposed Development will be considered. The assessment will focus on the likely impacts considered in this chapter of the Scoping Report, and where effects are identified, mitigation will be proposed where necessary to minimise any disturbance to receptors.

15.10 References

- Ref 15-1** HM Government (1974). Health and Safety at Work etc. Act 1974. Available at: Health and Safety Act Work Act.
- Ref 15-2** HM Government (1990)/ Environmental Protection Act 1990. Available at: Environmental Protection Act.
- Ref 15-3** HM Government (1993). Clean Air Act 1993. Available at: Clean Air Act.
- Ref 15-4** HM Government (1995). Environment Act 1995. Available at: Environment Act.
- Ref 15-5** HM Government (2000). Countryside and Rights of Way Act 2000. Available at: Countryside and Rights of Way Act.
- Ref 15-6** HM Government (2010). The Health Protection (Notification) Regulations 2010. Available at: The Health Protection Regulations.
- Ref 15-7** Planning Practice Guidance (PPG). Available at: Planning practice guidance - GOV.UK
- Ref 15-8** IEMA (2022). Guide to: Effective Scoping of Human Health in Environmental Impact Assessment. Available at: Effective Scoping of Human Health in EIA.
- Ref 15-9** IEMA (2022). Guide to: Determining Significance for Human Health in Environmental Impact Assessment. Available at: Determining Significance for Human Health.
- Ref 15-10** Public Health England (2017). Spatial Planning for Health: An evidence resource for planning and designing healthier places. Available at: Spatial Planning for Health.
- Ref 15-11** Public Health England (2019). PHE Strategy 2020 to 2025. Available at: PHE Strategy 2020 to 2025.
- Ref 15-12** Institute of Health Equity (2010). The Marmot Review: Fair Society, Healthy Lives. Available at: The Marmot Review.
- Ref 15-13** Institute of Health Equity (2020). Health Equity in England: The Marmot Review 10 Years On. Available at: The Marmot Review.
- Ref 15-14** Institute of Health Equity (2020). Build Back Fairer: The COVID-19 Marmot Review. Available at: The COVID-19 Marmot Review.
- Ref 15-15** Department of Health and Social Care (2025). NHS 10 Year Health Plan for England: Fit for the Future. Available at: NHS 10 Year Health Plan for England.
- Ref 15-16** Office of National Statistics, 2021 Census Data
- Ref 15-17** Office of National Statistics, Annual Population Survey (July 2024 – June 2025).
- Ref 15-18** Office of National Statistics, Claimant Count (September 2025).
- Ref 15-19** Department of Health & Social Care (2025). Local health, public health data for small geographic areas. Available at: Local Health, Public Health Data.
- Ref 15-20** Office of National Statistics (2022). National population projections: 2022-based.

- Ref 15-21** Public Health England (2017). Dahlgreen and Whitehead (1991) in Health profile for England 2017. Chapter 6: social determinants of health. Available at: Health Profile for England 2017.
- Ref 15-22** Barton, H. and Grant, M. (2006). A health map for the local human habitat. The Journal of Royal Society for the Promotion of Health.
- Ref 15-23** World Health Organization (WHO) (2018). Health inequalities and their causes. Available at: Health Inequalities and Causes.

16. Materials and Waste

16.1 Introduction

- 16.1.1 This chapter of the Scoping Report presents an initial baseline for materials and waste relevant to the Proposed Development. In addition, the chapter provides an overview of the assessment methodology to be followed for the materials and waste assessment and provisionally identifies the potential effects .
- 16.1.2 This chapter follows the methodology set out in the IEMA guide to: Materials and Waste in Environmental Impact Assessment, Guidance for a Proportionate Approach (now known as ISEP (Institute of Sustainability and Environmental Professionals) and referred from herein as the 'IEMA Guidance') (Ref 16-1).
- 16.1.3 For the purpose of this Scoping Report, materials and waste comprise:
- The consumption of materials (key construction materials only); and
 - The generation and management of waste.
- 16.1.4 Materials are defined in the IEMA Guidance as “physical resources that are used across the lifecycle of a development. Examples include concrete, aggregate, asphalt, bricks, ballast, mortar, glass and timber.”
- 16.1.5 Other material assets considered in the assessment include built assets such as landfill void capacity and safeguarded mineral and waste sites.
- 16.1.6 Mineral Safeguarding Areas (MSA) are not deemed to be safeguarded mineral sites and are not included in the IEMA Guidance (Ref 16-1) and therefore are not assessed in a materials and waste assessment.
- 16.1.7 Waste is defined as per the Waste Framework Directive (2008/98/EC) (Ref 16-2) as “any substance or object which the holder discards or intends or is required to discard”.

16.2 Legislation, Policy and Guidance

- 16.2.1 A brief overview of the policy, legislative and guidance relevant to the materials and waste assessment have been reviewed and summarised below.

Table 16-1: Legislation relevant to Materials and Waste

Legislation
Waste Framework Directive (Ref 16-2)
Environmental Protection Act (1990) (Ref 16-3)
Environment Act 2021 (Ref 16-7)
The Hazardous Waste (England and Wales) Regulations (2005) (Ref 16-4)
The Waste (England and Wales) Regulations (2011) (Ref 16-5)
The Environmental Permitting (England and Wales) Regulations (2016) (Ref 16-6)
The Waste (Miscellaneous Amendments) Regulations 2019 (Ref 16-8)

Table 16-2: National Planning Policy relevant to Materials and Waste

National Planning Policy
Overarching National Policy Statement for Energy (EN-1) (Ref 16-9)
National Policy Statement for Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4) (Ref 16-10)
National Planning Policy Framework (NPPF) (2024) (Ref 16-11)
National Planning Policy for Waste (2014) (Ref 16-12)
A Green Future: Our 25 Year Plan to Improve the Environment (2018) (Ref 16-13)
Our Waste, Our Resources, A Strategy for England (Resources and Waste Strategy for England) (2018) (Ref 16-14)
Environmental Improvement Plan (2023) (Ref 16-15)

Table 16-3: Standards and Guidance relevant to Materials and Waste

Standards and Guidance
IEMA Guidance (Ref 16-1)
Contaminated Land: Applications in Real Environments (CL:AIRE) Definition of Waste: Development Industry Code of Practice (DoWCoP), v2 (2011) (Ref 16-45)
Waste and Resources Action Programme (WRAP) Designing Out Waste: A Design Team Guide for Civil Engineering (Ref 16-46)
National Planning Policy Guidance (PPG) for Minerals (2014) (Ref 16-47) and waste (Ref 16-48)
Waste Duty of Care Codes of Practice (Ref 16-49)
Guidance on Applying the Waste Hierarchy (2011) (Ref 16-50)

16.3 Defining the Study Area

- 16.3.1 The Study Areas for the assessment of impacts related to materials and waste have been defined in line with the IEMA Guidance (Ref 16-1) as the 'Proposed Development Study Area' and the 'Expansive Study Area'. These are explained below.

Proposed Development Study Area

- 16.3.2 The Proposed Development Study Area for construction and operational waste generation and use of construction and operation materials comprises the Scoping Boundary. The Study Area is deemed to include the footprint of the proposed works, together with any temporary land requirements during the construction. This may include temporary offices, compounds and storage areas.
- 16.3.3 The Proposed Development Study Area for the impacts on safeguarded mineral and waste sites is defined by the Scoping Boundary. The location of safeguarded mineral and waste sites will be confirmed in the materials and waste assessment. Impacts on safeguarded waste sites are not included in the IEMA Guidance, however, impacts on such sites will be considered in the materials and waste assessment where appropriate.

Expansive Study Area

- 16.3.4 As outlined in the PPG for Waste (Ref 16-48) *“The principles of self-sufficiency and proximity (commonly referred to as the ‘proximity principle’) are set out in Article 16 of the Waste Framework Directive (Ref 16-2), Local planning authorities are required, under regulation 18 of the Waste (England and Wales) Regulations 2011 (Ref 16-5) which transposed the Directive, to have regard to these requirements when exercising their planning functions relating to waste management”.*
- 16.3.5 In addition, *“...though this should be the aim, there is no expectation that each local planning authority should deal solely with its own waste to meet the requirements of the self-sufficiency and proximity principles. Nor does the proximity principle require using the absolute closest facility to the exclusion of all other considerations. There are clearly some wastes which are produced in small quantities for which it would be uneconomic to have a facility in each local authority. Furthermore, there could also be significant economies of scale for local authorities working together to assist with the development of a network of waste management facilities to enable waste to be handled effectively”* (Ref 16-48).
- 16.3.6 The expansive Study Area for non-hazardous and inert waste management comprises the West Midlands, East Midlands and North West regions as outlined in the EA’s 2024 Waste Summary Tables for England - Version 1 (Ref 16-51). It is defined based on professional judgement and informed by consideration of the proximity principle and value for money.
- 16.3.7 Table 16-4 presents a summary of the local, county, and regional Study Areas for non-hazardous and inert waste management for the Proposed Development.

Table 16-4: Summary of Study Areas – Materials and Waste

Proposed Development Component	Local Administrative Area	County Administrative Area	Regional Area
Capture Facilities			
Breedon Capture Facility	High Peak District, Derbyshire Dales District	Derbyshire	East Midlands
Tarmac Capture Facility	High Peak District	Derbyshire	East Midlands
Buxton Lime Capture Facility	High Peak District	Derbyshire	East Midlands
Holcim Capture Facility	Staffordshire Moorlands District	Staffordshire	West Midlands
Pipelines			
Peak Cluster CCS Pipeline	High Peak District, Derbyshire Dales District, Cheshire East Unitary Authority,	Derbyshire, Cheshire, Staffordshire, Merseyside	East Midlands, West Midlands, North West

Proposed Development Component	Local Administrative Area	County Administrative Area	Regional Area
	Chester West and Chester Unitary Authority, Staffordshire Moorlands District, Wirral		
Coastal AGI to MLWS Pipeline(s)	Wirral	Merseyside	North West

- 16.3.8 The expansive Study Area for hazardous waste management is England. The Study Area is defined based on professional judgement and informed by consideration of the proximity principle and value for money.
- 16.3.9 The proximity principle for hazardous waste in England is outlined in Principle 2 - Infrastructure Provision in the Strategy for Hazardous Waste Management in England *“We look to the market for the development of hazardous waste infrastructure, which implements the hierarchy for the management of hazardous waste and meets the needs of the UK to ensure that the country as a whole is self-sufficient in hazardous waste disposal, facilities are put in place for hazardous waste recovery in England, and the proximity principle is met”* (Ref 16-52). Planning for hazardous waste management is also undertaken at a national level.
- 16.3.10 The expansive Study Area for availability of key construction materials is national (UK) for steel and the East Midlands, West Midlands, and North West regions for aggregates, asphalt, and concrete.

16.4 Baseline Environment

Existing Baseline

- 16.4.1 This section provides a summary of the baseline conditions in respect of materials and waste.

Availability of Key Construction Materials

- 16.4.2 At the time of writing the exact quantities of key construction materials (aggregate, asphalt concrete, and steel) required for the Proposed Development are unknown as the design is in early development.
- 16.4.3 Table 16-5 summarises national requirement in 2024 for steel and regional consumption in 2022 for aggregates, asphalt and concrete (the most recent years for which data is available). Requirement and consumption serves as proxy for availability.
- 16.4.4 It is anticipated that the majority of key construction materials would be sourced locally or regionally e.g. aggregate, asphalt, concrete, considering the proximity principle and value for money. Other materials such as steel would be sourced at a national or international level.

Table 16-5: Regional and National Availability of Key Construction Materials

Construction Material	National Availability (mt/yr)	West Midlands availability (mt/yr)	East Midlands availability (mt/yr)	North West availability (mt/yr)	Baseline data year	Data description
Steel	16	Not applicable – Steel will be assessed at the national level			2024	UK's steel requirement 2024, UK Steel Statistics 2025 (Ref 53)
Total aggregates (crushed rock and sand and gravel) (million tonnes)	Not applicable. These materials will be assessed at the regional level	11.4	36.7	9.0	2022	Minerals and mineral products sales in Great Britain, Profile of the UK Mineral Products Industry (Ref 54)
Ready mixed concrete (converted to million tonnes from m ³ using a density of 2.4 t / m ³ (Ref 55)		4.3	3.12	3.36	2022	
Asphalt (million tonnes)		1.7	3.3	2.1	2022	

16.4.5 Potential recycled contents for the main construction materials are outlined in Table 16-6. These “good practice” rates are derived from the Waste and Resources Action Programme’s (WRAP) Designing Out Waste Tool for Civil Engineering (Ref 16-46) and relevant to the selection of receptor sensitivity for materials.

Table 16-6: Potential Recycle Context

Material Type	Potential recycled context (% by weight)
Concrete	16
Asphalt	25
Aggregates	50
Steel reinforcement	100
Structural steel	60

Permitted Waste Sites, Waste Site Applications and Waste Exemptions

16.4.6 The location of five permitted waste sites have been identified with the Scoping Boundary of the Proposed Development, as set out in Table 16-7.

Table 16-7: Permitted Waste Sites identified within or near the Proposed Development

Proposed Development Component	Site Name	Permit Reference	Site Address	Licence Type	Licensed Name	Licence Issued	Status
Tarmac Capture Facility	Tunstead Quarry	EA/EPR/FB3405MC	Wormhill, Buxton, Derbyshire, SK17 8TG	S0908 - Management of inert or extractive waste at mine	Tarmac Cement Limited	26 September 2017	Issued
Breedon Capture Facility	Hope Cement Works	EA/EPR/BB3800LU	Hope, Derbyshire, S33 6RP	A07 - Industrial Waste Landfill (Factory curtilage)	Breedon Cement Limited	11 August 1982	Issued
Holcim Capture Facility	Lafarge – Cauldon Works Landfill Site	EA/EPR/SP3096FB	Yelsway Lane, Cauldon Low, Leek, Staffordshire, ST10 3EQ	A07 - Industrial Waste Landfill (Factory curtilage)	Lafarge Cement UK PLC	01 August 1977	Surrendered
Peak Cluster Pipeline/ Coastal AGI to MLWS Pipeline(s)	Moreton Landfill	EA/EPR/PP3091CT	Tarran Way, Moreton, Wirral, Merseyside, CH46 4TB	A05 - Landfill taking Non-Biodegradable Wastes	Annaban Limited	12 September 1990	Expired
Peak Cluster Pipeline/ Coastal AGI to MLWS Pipeline(s)	Moreton Landfill Site	EA/EPR/RP3298CU	Tarran Way Industrial Estate, Moreton, Merseyside, CH46 4TB	A16 - Physical Treatment Facility	Annaba Limited	28 February 2003	Expired

Table 16-8: Historic Landfills identified within or near the Proposed Development

Proposed Development Component	Site Name	Site Address	Licence Holder	Licensed Issued	Licence Surrendered	Waste Type
Pipeline (including AGIs)	Carr Lane Brickworks	Moreton, Wirral, Merseyside	Wirral Waste Limited	20 January 1986	No available information	Industrial, household, liquid sludge
Peak Cluster Pipeline & Holcim Capture Facility	Cauldon Cement Works	Cauldon Works, Cauldon Low, Leek, Staffordshire	Blue Circle Industries Plc	1 August 1977	31 January 2006	No available information
Peak Cluster Pipeline	Edge End Farm	Buxton Road, Leek, Staffordshire	Basil Howard Day	12 September 1989	10 July 1992	No available information
Peak Cluster Pipeline	Greenbank Road Landfill Site / Council Landfill Site / upper Birket Valley Landfill Site	Bounded by Saughall Massie Road / Newton Brook / and Greenbank Road, Hoylake, West Kirby, Wirral, Merseyside	Merseyside County Council	No available information	No available information	Industrial, household, liquid sludge
Breedon Capture Facility	Hope Works	Hope, Near Sheffield	Blue Circle Industries Limited	7 April 1978	18 May 1984	Industrial, liquid sludge
Peak Cluster Pipeline	Horsecroft Farm	Tittesworth, Leek, Staffordshire	No available information	No available information	No available information	No available information

Proposed Development Component	Site Name	Site Address	Licence Holder	Licensed Issued	Licence Surrendered	Waste Type
Breedon Capture Facility	Moss Rake	South-west of Bradwell, Derbyshire	Star Quarry Products Limited	10 March 1989	No available information	Inert
Breedon Capture Facility	Potter Barn	Clement Lane, Bradwell Moor, Bradwell, Sheffield, South Yorkshire	Nether Water Plant Services	11 November 1991	3 September 1993	Inert
Peak Cluster Pipeline	Silk Hill Farm	Bings Road, Whaley Bridge, Derbyshire	Shellabear-Price Limited	3 April 1986	No available information	No available information
Peak Cluster Pipeline	Silk Hill Farm	Bings Road, Whaley Bridge, Derbyshire	No available information	No available information	No available information	No available information
Tarmac Capture Facility	Tunstead Quarry Tip	Chapel-en-le-Frith, Derbyshire	No available information	No available information	No available information	No available information

Table 16-9: Permitted Landfills identified within or near the Proposed Development

Proposed Development Component	Site Name	Permit Reference	Site Address	Licence Holder	Licence Issued	Status
Peak Cluster Pipeline	Annaban Limited	EA/EPR/PP3091CT	Tarran Way, Moreton, Merseyside, CH46 4TB	No available information	No available information	Expired

- 16.4.7 No waste site applications have been identified within the Scoping Boundary.
- 16.4.8 Twenty-five waste exemptions across 17 site grid references have been identified as intersecting the Scoping Boundary of the pipelines associated with the Proposed Development, with some sites holding multiple exemptions. All sites are associated with built assets and are therefore unlikely to be impacted by the proposed pipelines.

Historic and Permitted Landfills

- 16.4.9 Historic landfills are potentially relevant to this assessment since excavations in historic landfill can give rise to waste that would require management. The EA's Historic Landfill Sites spatial data (Ref 57) identifies twelve historic landfills in the Scoping Boundary of the Proposed Development. Additional information on these landfill sites is presented in Table 16-10.
- 16.4.10 Two permitted landfills which sit within the Scoping Boundary of the Proposed Development have been identified. These are detailed in Table 16-10 as summarised from the EA's Permitted Waste Sites – Authorised Landfill Site Boundaries spatial data (Ref 16-58).

Capacity of Waste Management Facilities

Landfill Capacity

- 16.4.11 Baseline information consists of current landfill capacity in the West Midlands, East Midlands and North West for non-hazardous and inert waste and England for hazardous waste, as outlined in the EA's 2024 Waste Summary Tables for England – Version 1 (Ref 51) and Table 16-10.
- 16.4.12 For hazardous waste, total merchant landfill capacity in England at the end of 2024 was approximately 9.2 million m³. Hazardous restricted sites are not included as capacity may not be available to the Proposed Development. Restricted landfills only accept waste from a limited set of sources and producers, commonly the site operator, e.g. a manufacturing site.

Table 16-10: Landfill Capacity (2024) in West Midlands, East Midlands, North West and England

Landfill Type	West Midlands Landfill Capacity (000 m ³)	East Midlands Landfill Capacity (000 m ³)	North West Landfill Capacity (000 m ³)	England Landfill Capacity (000 m ³)
Hazardous Merchant	Not applicable. Hazardous waste is assessed at the England Level.			9,167
Non-hazardous with Stable Non-reactive Hazardous Waste (SNRHW) cell	3,443	15,104	8,671	3,443
Non-hazardous	22,667	15,518	9,905	22,667
Inert	8,787	19,228	5,020	8,787
Total non-hazardous and inert	34,897	49,850	23,596	34,897

Waste Management Infrastructure

- 16.4.13 The capacity of waste management infrastructure (aside from landfill) is not collated and publicly available; however, capacity can be inferred from annual waste inputs. Data is collated for the expansive Study Areas from the EA's Waste Data Interrogator 2024 – Waste Received (Excel) –

Version 1 (Ref 56) and presented in Table 16-11. Inputs are not totalled since the double counting of waste in the Waste Data Interrogator cannot be discounted.

Table 16-11: Summary of Waste Inputs by Facility (2024)

Facility Type	West Midlands (tonnes received)	East Midlands (tonnes received)	North West (tonnes received)
Landfill	5,313,220	3,377,297	2,954,615
Metal Recycling Site (MRS)	1,980,917	842,629	3,318,529
On/In Land	1,692,510	117,147	1,202,692
Transfer	4,219,888	4,304,352	6,431,274
Treatment	8,623,342	7,744,602	19,999,735
Use of Waste	49,778	-	-
Combustion	-	161,923	-
Incineration	2,072,125	1,494,244	3,362,361
Mining	-	3,000	-
Storage	410,281	338,151	48,577
Processing	277,838	198,918	849,361
Associated Process	224,783	2,547	-

- 16.4.14 The IEMA Guidance (Ref 1) (page 14) “does not consider waste processing and recovery facilities as sensitive receptors, rather: they are part of a system that has the potential to reduce the magnitude of adverse impacts associated with waste generation and disposal. Waste processing and recovery facilities are, hence, different to landfills, in that the latter are finite resources.” Therefore, a full list of waste management infrastructure is not included in the baseline.

National Hazardous Waste Management Facilities

- 16.4.15 Since some of the operational hazardous wastes likely to be generated by the Proposed Development will not be suitable for landfill disposal (e.g. liquid and sludge waste from carbon capture facilities), hazardous operational waste is compared to national hazardous waste management facility capacity in the assessment.
- 16.4.16 Liquid hazardous waste from the Proposed Development operation may be managed by high-temperature incineration or by physico-chemical treatment.
- 16.4.17 Due to the specialised nature of hazardous waste management, hazardous waste facilities typically receive wastes from a wide region, and therefore this assessment considers the national capacity for managing hazardous wastes.
- 16.4.18 There are a number of high-temperature incinerators for hazardous waste in England (excluding facilities which manage only clinical waste) as well as cement kilns which are permitted to accept hazardous waste. These facilities are reported in the EA’s Waste Data Interrogator for 2024 – Version 1 (Ref 56) and are shown in Table 16-12. Notably, the Holcim Cauldon Cement Plant is a project partner of the Proposed Development.

Table 16-12: Hazardous Waste Incineration Facilities and Cement Kilns Accepting Hazardous Waste

Facility	Location	2024 Waste Received (Tonnes of Hazardous Waste)
Hazardous Waste Incinerators		
Avonmouth Treatment Centre	Bristol	473
East Kent Waste Recovery Facility	Kent	1,053
Ellesmere Port Incinerator	Cheshire	57,195
Fawley High Temperature Incinerator	Hampshire	21,565
Fine Environmental Services – Seal Sands	Tees Valley	20,002
Tradebe Heysham Limited	Lancashire	44,152
Twinswoods Co-incinerator	Bedford	8,083
Cement Kilns accepting Hazardous Waste		
Cauldon Cement Plant	Staffordshire	10,268
Ketton Works	Rutland	16,818
Ribblesdale Cement Works	Ribble Valley	21,417
Whitwell Quarry Lime Works	Derbyshire	30,543
Total		231,569

16.4.19 The EA's 2024 Waste Data Interrogator (Ref 16-56) shows that the following quantities of liquid hazardous waste were treated by permitted facilities in England (excluding waste in EWC Code Chapter 13 'Oil Wastes and Wastes of Liquid Fuels') – refer to Table 16-13. Inputs are totalled, however, double counting of waste in the Waste Data Interrogator cannot be discounted.

Table 16-13: Hazardous Liquid Waste Treatment Facilities in England

Facility Permit Type	2024 Waste Received (Tonnes)
T05: Physico-chemical treatment installation	285,758
T06: Chemical treatment installation	129,315
T10: Haz waste treatment installation	203,352
T11: Haz waste transfer/treatment installation	44,728
Total	663,153

Targets

16.4.20 The national target for recovery of construction and demolition waste is 70% by weight, as set out in the Waste Framework Directive (Ref 16-2) and the Waste Management Plan for England (Ref 16-52). The target specifically excludes naturally occurring materials with EWC Code 17 05 04 (soil and

stones other than those mentioned in 17 05 03 (soils and stone containing dangerous substances)). Recovery is deemed to include reuse, recycling and other recovery, e.g. energy recovery.

- 16.4.21 A good practice landfill diversion target of 90% has been achieved and exceeded by major UK developments as outlined in the IEMA Guidance (Ref 1). In 2022, England generated 63 million tonnes of non-hazardous C&D waste, of which 59.4 million tonnes were recovered. This represents a recovery rate of 94.3% (Ref 16-59).
- 16.4.22 Standard, good and best practice recovery rates by material are provided by WRAP (Ref 16-60). Recovery rates for key construction materials and other construction wastes relevant to the Proposed Development are provided in Table 16-14.

Table 16-14: Standard, Good and Best Practice Recovery Rates by Material

Material	Standard Practice Recovery (%)	Good Practice Recovery	Best Practice Recovery
Metals	95	100	100
Packaging	60	85	95
Concrete	75	95	100
Inert	75	95	100
Plastics	60	80	95
Miscellaneous	12	50	75
Electrical equipment	Limited information	70	95
Cement	Limited information	75	95
Liquids and oils	100	100	100
Hazardous	50	Limited information, cannot be 100% since some hazardous waste (e.g. asbestos must be landfilled)	

Future Baseline

- 16.4.23 There is no publicly available information on any potential long-term changes to the national and regional demand by the time of construction of the Proposed Development. Construction material demand such as ready mixed concrete is closely aligned to both the quantity of construction taking place and the general economy; therefore, it is deemed inappropriate to forecast future demand as the demand is unlikely to be linear. It is therefore not possible to set a future baseline for materials. Therefore, future consumption is assumed to be the same as the current baseline.
- 16.4.24 There is no publicly available information regarding any potential changes to landfill capacity by the time of the Proposed Development's construction.
- 16.4.25 Due to the cyclic nature of inert and hazardous landfill capacity (e.g. landfill capacity decreasing, and then new sites or landfill cells being opened with landfill capacity increasing), it is not realistic to forecast future landfill capacity. Therefore, inert and hazardous landfill capacity is assumed to remain the same as the current baseline as outlined in Table 16-10.

16.4.26 For non-hazardous waste, using the current rate of decline of landfill capacity and forecasting into the future would lead to the inevitable conclusion that there would be no void space remaining. However, this is not a credible scenario as if there is still a need for landfill, then the Waste Planning Authorities (WPAs) will need to consent new landfill capacity to replace that which has been used up. Therefore, non-hazardous landfill capacity is assumed to remain the same as the current baseline, as outlined in Table 16-10.

16.5 Scope and Methodology

16.5.1 This section outlines the scope and methodology that will be employed for assessing the likely significant effects associated with materials and waste.

Scope

16.5.2 The scoping of potential effects from the Proposed Development during the construction, operation and decommissioning phases are presented in Table 16-22 and Table 16-23.

Assessment Methodology

16.5.3 This section outlines the methodology that will be employed for assessing the likely significant effects associated with materials and waste. The IEMA Guidance (Ref 1) offers two methods for the assessment of waste. Method W1 – void capacity has been selected as this is a more detailed methodology and is appropriate for larger and more complex projects.

16.5.4 Method W2 – landfill diversion – is a simpler approach and deemed to be less robust than Method W1. Developments are compared to a good practice landfill diversion rate of 90% (as achieved and exceeded by major UK developments and organisations).

16.5.5 The sensitive receptors for this assessment of construction impacts are:

- Materials, national consumption of key construction materials – as outlined in the IEMA Guidance (Ref 16-1):
 - “Materials are, in their own right, sensitive receptors. Consuming materials impacts upon their immediate and (in the case of primary material) long-term availability; this results in the depletion of natural resources and adversely impacts the environment.”;
- Landfill void capacity in the expansive Study Area of the East Midlands, West Midlands, North West (non-hazardous landfill void capacity) and England (hazardous landfill void capacity) – as defined in the IEMA Guidance (Ref 16-1):
 - “Landfill is a finite resource, and hence – through the ongoing disposal of waste – there is a continued need to expand existing and develop new facilities. This requires the depletion of natural and other resources which, in turn, adversely impacts the environment.”; and
- Safeguarded mineral and waste sites. As stated in paragraph 16.3.14, the IEMA Guidance (Ref 1).

Methodology for Determining Construction Effects

Materials

16.5.6 Effects upon materials during construction of the Proposed Development will be assessed by:

- Establishing the baseline for national or regional availability of key construction materials by weight;

- Assessing the sensitivity of materials as related to the availability and types of materials to be consumed by the Proposed Development during construction;
- Establishing the quantities of key construction materials required for the construction of the Proposed Development; and
- Comparing the total quantities of key construction materials with the availability (utilising a percentage approach).

Waste

16.5.7 Effects upon waste during construction of the Proposed Development will be assessed by:

- Establishing the baseline landfill void capacity in the expansive Study Areas;
- Assessing the sensitivity of landfill void capacity;
- Establishing the quantities of waste to be generated during construction of the Proposed Development; and
- Comparing the total waste arising from the Proposed Development against the landfill void capacity (using a percentage approach) assuming a worst-case scenario that all waste goes to landfill.

Methodology for Determining Operational Effects

16.5.8 Effects upon waste during operation of the Proposed Development will be assessed by:

- Establishing the baseline landfill void capacity in the expansive Study Areas;
- Assessing the sensitivity of landfill void capacity;
- Establishing the quantities of operational waste to be generated during the operation of the Proposed Development;
- Comparing the total waste arising from the operation of the Proposed Development against the landfill void capacity (utilising a percentage approach); and
- Comparing operational hazardous waste arisings from the operation of the Proposed Development against national hazardous waste management facility waste inputs (utilising a percentage approach).

Assessment Criteria

Sensitivity

16.5.9 The sensitivity of materials relates to the availability and type of construction materials to be consumed by the Proposed Development. The IEMA Guidance criteria described within Table 16-15 will be used to determine the sensitivity of materials.

Table 16-15: Materials Receptor Sensitivity

Effects	Criteria for Materials Receptor Sensitivity
Negligible	On balance, the key materials required for the construction, operation, and decommissioning of the Proposed Development are forecast (through trend analysis and other information) to be free from known issues regarding supply and stock And/or

Effects	Criteria for Materials Receptor Sensitivity
	are available comprising a very high proportion of sustainable features and benefits compared to industry-standard materials*
Low	On balance, the key materials required for the construction, operation, and decommissioning of the Proposed Development are forecast (through trend analysis and other information) to be generally free from known issues regarding supply and stock. And/or are available comprising a high proportion of sustainable features and benefits compared to industry-standard materials.
Medium	On balance, the key materials required for the construction, operation, and decommissioning of the Proposed Development are forecast (through trend analysis and other information) to suffer from some potential issues regarding supply and stock. And/or are available comprising some sustainable features and benefits compared to industry-standard materials.
High	On balance, the key materials required for the construction, operation, and decommissioning of the Proposed Development are forecast (through trend analysis and other information) to suffer from known issues regarding supply and stock. And/or Comprise little or no sustainable features and benefits compared to industry-standard materials.
Very High	On balance, the key materials required for the construction, operation, and decommissioning of the Proposed Development are forecast are known to be insufficient in terms of production, supply and/or stock. And/or Comprise no sustainable features and benefits compared to industry-standard materials.
* Subject to supporting evidence, sustainable features and benefits could include, for example, materials or products that: comprise reused, secondary or recycled content (including excavated and other arisings); support the drive to a circular economy; or in some other way reduce lifetime environmental impacts.	

- 16.5.10 The sensitivity of waste relates to availability of landfill capacity in the absence of the Proposed Development. As outlined in the IEMA Guidance “landfill capacity is recognised as an unsustainable and increasingly scarce option for managing waste”. The sensitivity of landfill capacity is assessed based on a review of historic landfill void capacity trends where available and information from relevant policy documents.
- 16.5.11 The criteria described within Table 16-16 and Table 16-17 will be used to determine the sensitivity of landfill capacity.

Table 16-16: Inert and Non-Hazardous Landfill Capacity Sensitivity

Effects	Criteria for Inert and Non-Hazardous Landfill Capacity Sensitivity
Negligible	Across construction, operation, and decommissioning phases, the baseline/future baseline (i.e. without the Proposed Development) of regional inert and non-hazardous landfill capacity is expected to remain unchanged, or is expected to increase through a committed change in capacity.
Low	Across construction, operation, and decommissioning phases, the baseline/future baseline (i.e. without the Proposed Development) of regional inert and non-hazardous landfill capacity is expected to reduce minimally by <1% as a result of wastes forecast.
Medium	Across construction, operation, and decommissioning phases, the baseline/future baseline (i.e. without the Proposed Development) of regional inert and non-hazardous landfill capacity is expected to reduce noticeably by 1-5% as a result of wastes forecast.
High	Across construction, operation, and decommissioning phases, the baseline/future baseline (i.e. without the Proposed Development) of regional inert and non-hazardous landfill capacity is expected to reduce considerably: by 6-10% as a result of wastes forecast.
Very High	Across construction, operation, and decommissioning phases, the baseline/future baseline (i.e. without the Proposed Development) of regional inert and non-hazardous landfill capacity is: — expected to reduce very considerably (by >10%); — end during construction or operation; — is already known to be unavailable; or, — would require new capacity or infrastructure to be put in place to meet forecast demand.

Table 16-17: Hazardous Landfill Capacity Sensitivity

Effects	Criteria for Inert and Non-Hazardous Landfill Capacity Sensitivity
Negligible	Across the construction, operation, and decommissioning phases, the baseline/future baseline (i.e. without the Proposed Development) of regional (or where justified, national) hazardous landfill capacity is expected to remain unchanged, or is expected to increase through a committed change in capacity.
Low	Across the construction, operation, and decommissioning phases, the baseline/future baseline (i.e. without the Proposed Development) of regional (or where justified, national) hazardous landfill capacity is expected to reduce minimally by <0.1% as a result of wastes forecast.
Medium	Across the construction, operation, and decommissioning phases, the baseline/future baseline (i.e. without the Proposed Development) of regional (or where justified, national) hazardous

Effects	Criteria for Inert and Non-Hazardous Landfill Capacity Sensitivity
	landfill capacity is: expected to reduce noticeably by 0.1-0.5% as a result of wastes forecast.
High	Across the construction, operation, and decommissioning phases, the baseline/future baseline (i.e. without the Proposed Development) of regional (or where justified, national) hazardous landfill capacity is: expected to reduce noticeably by 0.1-0.5% as a result of wastes forecast.
Very High	Across the construction, operation, and decommissioning phases, the baseline/future baseline (i.e. without the Proposed Development) of regional (or where justified, national) hazardous landfill capacity is: — expected to reduce very considerably (by >1%); — end during construction or operation; — is already known to be unavailable; or, — would require new capacity or infrastructure to be put in place to meet forecast demand.

Magnitude

16.5.12 The magnitude of impact describes the degree of variation from the baseline conditions as result of the Proposed Development. The methodology for assessing the magnitude of impact from materials comprises a percentage-based approach that determines the influence of construction materials use on the baseline national demand from the construction of the Proposed Development. The IEMA Guidance criteria used to assess the magnitude of impact for materials are provided within Table 16-18.

Table 16-18: Materials Magnitude of Impacts

Effects	Criteria for Materials Magnitude of Impacts
No change	Consumption of no materials is required.
Negligible	Consumption of no individual material type is equal to or greater than 1% by volume of the national* baseline availability.
Minor	Consumption of one or more materials is between 1-5% by volume of the national* baseline availability. And/or The Proposed Development has the potential to adversely and substantially impact access to one or more allocated mineral site (in their entirety), placing their future use at risk.
Moderate	Consumption of one or more materials is between 6-10% by volume of the national* baseline availability. And/or one allocated mineral site is substantially sterilised by the Proposed Development rendering it inaccessible for future use.
Major	Consumption of one or more materials is >10% by volume of the national* baseline availability.

Effects	Criteria for Materials Magnitude of Impacts
	And/or more than one allocated mineral site is substantially sterilised by the Proposed Development rendering it inaccessible for future use
*a national baseline is used in the absence of regional construction material consumption data.	

16.5.13 The methodology for assessing the magnitude of impact for waste comprises a percentage-based approach that determines the influence of waste generation from the construction Proposed Development on the baseline landfill capacity. The IEMA Guidance criteria used to assess the magnitude of impact for materials and waste are provided within Table 16-19 and Table 16-20.

Table 16-19: Inert and Non Hazardous Waste – Magnitude of Impact

Effects	Criteria for Waste Magnitude of Impacts
No change	Zero waste generation and disposal from the Proposed Development.
Negligible	Waste generated by the Proposed Development will reduce expansive Study Area landfill capacity baseline# by <1%
Minor	Waste generated by the Proposed Development will reduce expansive Study Area landfill capacity baseline# by 1-5%
Moderate	Waste generated by the Proposed Development will reduce expansive Study Area landfill capacity baseline# by 6-10%.
Major	Waste generated by the Proposed Development will reduce expansive Study Area landfill capacity baseline# by >10%
# forecast as the worst-case scenario, during a defined construction and/or operational phase.	

Table 16-20: Hazardous Waste – Magnitude of Impact

Effects	Criteria for Hazardous Waste Magnitude of Impacts
No change	Zero waste generation and disposal from the Proposed Development.
Negligible	Waste generated by the Proposed Development will reduce expansive Study Area landfill capacity baseline# by <0.1%
Minor	Waste generated by the Proposed Development will reduce expansive Study Area landfill capacity baseline# by <0.1-0.5%
Moderate	Waste generated by the Proposed Development will reduce expansive Study Area landfill capacity baseline# by <0.5-1%
Major	Waste generated by the Proposed Development will reduce expansive Study Area landfill capacity baseline# by >1%
* forecast as the worst-case scenario, during a defined construction and/or operational phase.	

Effect Significance

16.5.14 Table 16-21 describes the effect thresholds used in determining the significance of potential effects.

Table 16-21: Effects Threshold

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

16.5.15 Effects which are determined to be Very Large, Large or Moderate are considered Significant. Those considered to be Slight or Neutral are considered to be Not Significant.

Consultation

16.5.16 As part of the EIA process, consultation will be undertaken with the relevant statutory bodies, if required, to inform the assessment and mitigation for the Proposed Development.

Assumptions and Limitations

16.5.17 The following assumptions and limitations have been identified in relation to materials and waste:

- Waste producers have a legal duty of care to manage their waste in accordance with regulations and to ensure that any waste leaving the site where it is generated is transferred to a suitably licensed facility for further treatment or disposal;
- Facilities transferring, treating or disposing of waste must be either licensed or apply for an exemption from a licence, and impacts arising from the operation of waste management facilities are considered as part of the planning and permitting process for these facilities themselves;
- As part of their planning function, Waste Planning Authorities (WPAs) are required to ensure that sufficient land is available to accommodate facilities for the treatment of all waste arising in the area, either within the WPA area, or through export to suitable facilities in other areas; and
- Minerals Planning Authorities (MPAs) are similarly required to ensure an adequate supply of minerals, sufficient to meet the needs of national and regional supply policies, and local development needs.
- The materials and waste scoping has been undertaken on the basis of information available at the time of the writing.

- As stated in the IEMA Guidance, "due to uncertainties relating to future technologies and infrastructure, this first edition of the guidance does not incorporate a proposed methodology to assess impacts and effects during decommissioning or end of first life". However, the criteria in the IEMA Guidance will also be applied to decommissioning for the Proposed Development in the absence of published guidance.

Summary of Issues to be Scoped in / Out

16.5.18 A summary of the issues to be scoped in or out of the materials and waste assessment is presented in Table 16-22 to Table 16-23.

Table 16-22: Materials and Waste Scope

Materials and Waste – Capture Facilities				
Scope Scoped in ✓, scoped out ✗	Construction (C), Operation (O), Decommissioning (D)			Rationale
	C	O	D	
Changes in demand for materials	✓	✗	✗	Construction: The quantities and types of construction materials to be used are not yet known at this stage. As such on a precautionary basis, potential impact on demand for materials has been scoped into the EIA. Operation: Forecast effects are (using professional judgement on the likely quantities and types of materials) considered negligible in relation to the scale and nature of the Proposed Development. Decommissioning: Forecast effects are (using professional judgement on the likely quantities and types of materials) considered negligible in relation to the scale and nature of the Proposed Development. This is likely to be less than construction.
Changes in available landfill void capacity (for both hazardous and non-hazardous waste)	✓	✓	✓	Construction: The quantities and types of waste to be generated are not yet known at this stage. As such on a precautionary basis, potential impact on landfill capacity has been scoped into the EIA. Operation: During operation the carbon capture facilities will generate waste. The quantities and types of waste to be generated in operation are not yet known. Decommissioning: Quantified effects associated with decommissioning as the Proposed Development has a long design life and as such it is not considered possible to reliably forecast decommissioning requirements and infrastructure

Materials and Waste – Capture Facilities				
				far in the future. A qualitative assessment will be included in the ES.
Changes to hazardous waste management facility inputs	✗	✓	✗	Construction & Decommissioning: The IEMA Guidance (Ref 1) (page 14) “does not consider waste processing and recovery facilities as sensitive receptors, rather: they are part of a system that has the potential to reduce the magnitude of adverse impacts associated with waste generation and disposal. Waste processing and recovery facilities are, hence, different to landfills, in that the latter are finite resources.” Therefore, a full list of waste management infrastructure is not included in the baseline and will not be considered at construction and decommissioning phases. Operation: Since some of the operational hazardous wastes likely to be generated by the Proposed Development will not be suitable for landfill disposal (e.g. liquid and sludge waste from carbon capture facilities), hazardous operational waste will be compared to national hazardous waste management facility capacity in the assessment.
Changes to safeguarded mineral sites.	✓	✓	✓	Construction, Operation & Decommissioning: The location of safeguarded mineral sites will be confirmed in the materials and waste assessment. Impacts on such sites will be considered in the materials and waste assessment if appropriate.
Changes to safeguarded allocated waste sites.	✓	✓	✓	Construction, Operation & Decommissioning: The location of safeguarded waste sites will be confirmed in the materials and waste assessment. Impacts on safeguarded waste sites are not included in the IEMA Guidance however impacts on such sites will be considered in the materials and waste assessment if appropriate.
Waste arising from extraction, processing and manufacture of construction components and products.	✗	✗	✗	Construction, Operation & Decommissioning: This assumes that these products and materials are being developed in a manufacturing environment with their own waste management plans, facilities, and supply chain, which are potentially in different regions of the UK or the world and therefore outside of the geographical scope of this study. Such matters cannot be accurately predicted and

Materials and Waste – Capture Facilities				
				assessed in the ES as they relate to procurement decisions that cannot be assured.
Other environmental impacts associated with the management of waste from the Proposed Development e.g., on water resources, air quality, noise or traffic resulting from the generation, handling, on-site temporary storage or off-site transport of materials and waste.	x	x	x	Construction, Operation & Decommissioning: These are addressed separately in other relevant chapters of this EIA Scoping Report (refer to Chapter 5: Air Quality, Chapter 9: Noise and Vibration, Chapter 13: Geology and Ground Conditions, Chapter 8: Traffic and Movement and Chapter 11: Water Environment and Flood Risk).
Off-site environmental impacts at waste management facilities	x	x	x	Construction, Operation & Decommissioning: As stated in the IEMA Guidance: “the indirect impacts of off-site waste management facilities and material production facilities are generally assumed to be assessed (and where necessary mitigated) under the planning and permitting regime for those sites and thus do not normally require assessment as part of an EIA for a development that uses such facilities for material supply or waste management”. This approach is considered to be applicable because at this stage, no likely significant indirect impacts have been identified arising specifically from the management of the Proposed Development’s waste at off-site waste facilities. This approach will be reviewed at the ES stage.

Table 16-23: Materials and Waste Scope – Peak Cluster Pipeline and Coastal AGI to MLWS Pipeline(s)

Materials and Waste – Peak Cluster Pipeline and Coastal AGI to MLWS Pipeline(s)				
Scope Scoped in ✓, scoped out x	Construction (C), Operation (O), Decommissioning (D)			Rationale
	C	O	D	
Changes in demand for materials	✓	x	x	Construction: The quantities and types of construction materials to be used are not yet known at this stage. As such on a precautionary basis, potential impact on demand for materials has been scoped into the EIA.

Materials and Waste – Peak Cluster Pipeline and Coastal AGI to MLWS Pipeline(s)

				Operation: Forecast effects are (using professional judgement on the likely quantities and types of materials) considered negligible in relation to the scale and nature of the Proposed Development. Decommissioning: Forecast effects are (using professional judgement on the likely quantities and types of materials) considered negligible in relation to the scale and nature of the Proposed Development. This is likely to be less than construction.
Changes in available landfill void capacity	✓	✓	✓	Construction: The quantities and types of waste to be generated are not yet known at this stage. As such on a precautionary basis, potential impact on landfill capacity has been scoped into the EIA. Operation: During operation the pipeline and AGIs will require minimal maintenance, generating minimal volumes of waste in relation to the scale and nature of the Proposed Development. A qualitative assessment will be included in the ES. Decommissioning: Quantified effects associated with decommissioning as the Proposed Development has a long design life and as such it is not considered possible to reliably forecast decommissioning requirements and infrastructure far in the future. A qualitative assessment will be included in the ES.
Changes to safeguarded mineral sites.	✓	✓	✓	Construction, Operation & Decommissioning: The location of safeguarded mineral sites will be confirmed in the materials and waste assessment. Impacts on safeguarded mineral sites are not included in the IEMA Guidance however impacts on such sites will be considered in the materials and waste assessment if appropriate.
Changes to safeguarded allocated waste sites.	✓	✓	✓	Construction, Operation & Decommissioning: The location of safeguarded waste sites will be confirmed in the materials and waste assessment. Impacts on safeguarded waste sites are not included in the IEMA Guidance however impacts on such sites will be considered in the materials and waste assessment if appropriate.
Waste arising from extraction, processing and manufacture of construction components and products.	✗	✗	✗	Construction, Operation & Decommissioning: This assumes that these products and materials are being developed in a manufacturing environment with their own waste management plans, facilities, and supply chain, which are potentially in different

Materials and Waste – Peak Cluster Pipeline and Coastal AGI to MLWS Pipeline(s)				
				regions of the UK or the world and therefore outside of the geographical scope of this study. Such matters cannot be accurately predicted and assessed in the ES as they relate to procurement decisions that cannot be assured.
Other environmental impacts associated with the management of waste from the Proposed Development e.g., on water resources, air quality, noise or traffic resulting from the generation, handling, on-site temporary storage or off-site transport of materials and waste.	x	x	x	Construction, Operation & Decommissioning: These are addressed separately in other relevant chapters of this EIA Scoping Report (refer to Chapter 5: Air Quality, Chapter 9: Noise and Vibration, Chapter 13: Geology and Ground Conditions, Chapter 8: Traffic and Movement and Chapter 11: Water Environment and Flood Risk).
Off-site environmental impacts at waste management facilities	x	x	x	Construction, Operation & Decommissioning: As stated in the IEMA Guidance: “the indirect impacts of off-site waste management facilities and material production facilities are generally assumed to be assessed (and where necessary mitigated) under the planning and permitting regime for those sites and thus do not normally require assessment as part of an EIA for a development that uses such facilities for material supply or waste management”. This approach is considered to be applicable because at this stage, no likely significant indirect impacts have been identified arising specifically from the management of the Proposed Development’s waste at off-site waste facilities. This approach will be reviewed at the PEIR stage.

16.6 Mitigation

- 16.6.1 The Proposed Development will aim to prioritise waste prevention, followed by preparing for reuse, recycling and recovery and lastly disposal to landfill as per the waste hierarchy (Plate 16-1).
- 16.6.2 The following mitigation measures will be considered and implemented where applicable during the design phases and subsequent construction work:
- Design for reuse and recovery: identifying, securing and using materials that already exist on-site, or can be sourced from other projects;
 - Design for materials optimisation: simplifying layout and form to minimise material use, using standard design parameters, balancing cut and fill, maximising the use of renewable materials and materials with recycled content;

- Design for off-site construction: maximising the use of pre-fabricated structure and components, encouraging a process of assembly rather than construction;
- Design for the future (deconstruction and flexibility): identify how materials can be designed to be more easily adapted over an asset lifetime and how deconstructability and demountability of elements can be maximised at end of first life;
- Design for waste and material asset efficient procurement: identify and specify materials that can be acquired responsibly, in accordance with a recognised industry standard; and
- Engineering plan configurations and layouts that show how the most effective use of materials and arisings can be achieved.

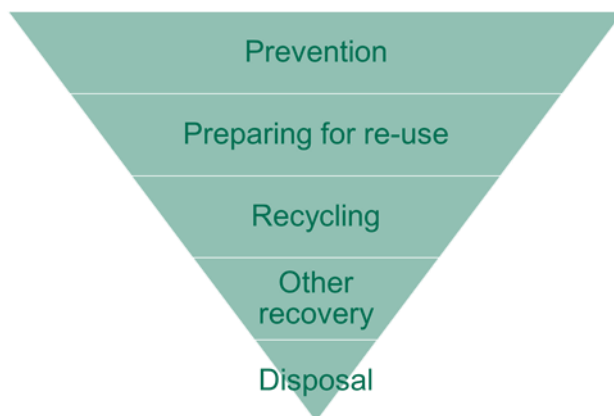


Plate 16-1: The Waste Hierarchy – from DEFRA’s guidance on Applying the Waste Hierarchy

- 16.6.3 An Outline CEMP will be prepared, setting out the key measures to be employed during the Proposed Development’s construction phase to control and minimise the impacts on the environment. The Outline CEMP will include an Outline Site Waste Management Plan (SWMP) in its appendices which sets out how waste would be managed during construction, and opportunities to prevent, reuse and recycle waste would be explored in accordance with the waste hierarchy.
- 16.6.4 Final CEMP(s) and detailed SWMP(s) would be prepared by the construction contractor in accordance with the Outline CEMP prior to construction. A Materials Management Plan (MMP) will be developed under the CL:AIRE Definition of Waste: Development Industry Code of Practice (Ref 16-45) by the construction contractor if required to support the reuse of excavated materials, minimise off-site disposal; and to demonstrate the necessary lines of evidence to support the proper reuse/off-site disposal of materials and ensure compliance with regulatory guidance
- 16.6.5 A DEMP for the relevant part of the Proposed Development would be prepared prior to decommissioning of that part commencing. Each DEMP will consider potential environmental risks associated with the decommissioning of the relevant part of the Proposed Development and would contain guidance on how risks can be removed or mitigated.
- 16.6.6 Embedded measures will be considered prior to the assessment of effects to avoid considering assessment scenarios that are unrealistic in practice, i.e. do not take account of such measures even though they are likely to be standard practice (tertiary mitigation) and/or form part of the design of the Proposed Development (embedded mitigation). These will then be followed through the assessment to ensure that realistic likely environmental effects are identified. Where likely significant adverse effects are identified after considering these embedded measures, additional mitigation will be considered, developed and proposed, where possible.

- 16.6.7 All mitigation measures will be described within the ES with the rationale for their inclusion clearly stated.

16.7 Summary

- 16.7.1 This chapter presents an initial baseline for materials and waste, an overview of the assessment methodology to be followed during the environmental assessment and identifies the potential effects of the Proposed Development.

16.8 References

- Ref 16-1** Institute of Environmental Management and Assessment (IEMA) (now the Institute of Sustainability and Environmental Professionals (ISEP)) (2020). Guide To: Materials and Waste in Environmental Impact Assessment, Guidance for a Proportionate Approach. Available at: <https://iema-materials-and-waste-in-eia-march-2020.pdf>
- Ref 16-2** European Union (2008). Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives (2008/98/EC). Available at: <https://eur-lex.europa.eu/eli/dir/2008/98/oj/eng>
- Ref 16-3** His Majesty's Stationery Office (HMSO). Environmental Protection Act 1990 and Part 2A (the Contaminated Land Regime). Available at: <https://www.legislation.gov.uk/ukpga/1990/43/contents>
- Ref 16-4** HMSO (2005). The Hazardous Waste (England and Wales) Regulations 2005. Available at: <https://www.legislation.gov.uk/uksi/2005/894/contents>
- Ref 16-5** HMSO (2011). The Waste (England and Wales) Regulations 2011 as amended, SI 1889. Available at: <https://www.legislation.gov.uk/uksi/2011/988/contents/made>
- Ref 16-6** HMSO (2016). The Environmental Permitting (England and Wales) Regulations (EPR) 2016. Available at: <https://www.legislation.gov.uk/uksi/2016/1154/contents>
- Ref 16-7** HMSO (2021). Environment Act. Available at: <https://www.legislation.gov.uk/ukpga/2021/30/contents>
- Ref 16-8** Department for Environment, Food & Rural Affairs (Defra) (2018). The Waste (Miscellaneous Amendments) (EU Exit) (No.2) Regulations 2019: Explanatory Memorandum. Available at: https://assets.publishing.service.gov.uk/media/5c19314ded915d0c736a1ef7/the_Waste_Miscellaneous_Amendments_EU_Exit_No._2_Regulations_2019_-_EM.pdf
- Ref 16-9** Department for Energy Security and Net Zero (DESNZ) (2023). Overarching National Policy Statement for Energy (EN-1). Available at: <https://assets.publishing.service.gov.uk/media/65a7864e96a5ec0013731a93/overarching-nps-for-energy-en1.pdf>
- Ref 16-10** DESNZ (2023). National Policy Statement for natural gas supply infrastructure and gas and oil pipelines (EN-4). Available at: <https://www.gov.uk/government/publications/national-policy-statement-for-natural-gas-supply-infrastructure-and-gas-and-oil-pipelines-en-4>

- Ref 16-11** Ministry of Housing, Communities and Local Government (MHCLG)_and Department for Levelling Up, Housing and Communities (DLUHC) (2024). National Planning Policy Framework. Available at: <https://www.gov.uk/government/publications/national-planning-policy-framework--2>
- Ref 16-12** MHCLG and DLUHC (2014). National Planning Policy for Waste. Available at: <https://www.gov.uk/government/publications/national-planning-policy-for-waste>
- Ref 16-13** Defra (2018). Our Green Future: Our 25 year plan to improve the environment. UK Government. Available at: <https://www.gov.uk/government/publications/25-year-environment-plan>
- Ref 16-14** Defra (2018). Our Waste, Our Resources: A Strategy for England. Available at: <https://assets.publishing.service.gov.uk/media/5c18f11740f0b60bbe0d827/resources-waste-strategy-dec-2018.pdf>
- Ref 16-15** HM Government (2023). Environmental Improvement Plan 2023: First Revision of the 25 Year Environment Plan. Available at: <https://www.gov.uk/government/publications/environmental-improvement-plan>
<https://assets.publishing.service.gov.uk/media/5c18f11740f0b60bbe0d827/resources-waste-strategy-dec-2018.pdf>
- Ref 16-16** Contaminated Land: Applications in Real Environments (2009). Definition of Waste: Development Industry Code of Practice v2 (2011). Available at: <https://claire.co.uk/projects-and-initiatives/dow-cop>
- Ref 16-17** Waste and Resources Action Programme (WRAP) (2009). Designing Out Waste: A Design Team Guide for Civil Engineering. No longer available online.
- Ref 16-18** MHCLG and DLUHC (2014). Planning Policy Guidance for Minerals. Available at: <https://www.gov.uk/guidance/minerals>
- Ref 16-19** MHCLG and DLUHC (2016). Planning Policy Guidance for Waste. Available at: <https://www.gov.uk/guidance/waste>
- Ref 16-20** Defra and Environment Agency (2016). Waste duty of care code of practice. Available at: <https://www.gov.uk/government/publications/waste-duty-of-care-code-of-practice>
- Ref 16-21** Defra (2011). Guidance on Applying the Waste Hierarchy. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/69403/pb13530-waste-hierarchy-guidance.pdf
- Ref 16-22** Environment Agency (2025). 2024 Waste Summary Tables for England – Version 1. Available at: 2024 Waste Data Interrogator - data.gov.uk
- Ref 16-23** Defra (2021). The Waste Management Plan for England. Available at: <https://assets.publishing.service.gov.uk/media/60103f71d3bf7f05bc42d294/waste-management-plan-for-england-2021.pdf>
- Ref 16-24** UK Steel (2025). UK Steel Statistics 2025. Available at: <https://www.uksteel.org/reports-and-publications>

- Ref 16-25** Mineral Products Association (MPA) (2023). Profile of the UK Mineral Products Industry. Available at: <https://www.mineralproducts.org/Facts-and-Figures/Profile-of-the-UK-Mineral-Products-Industry.aspx>
- Ref 16-26** Circular Ecology (2024). Inventory of Carbon & Energy (ICE) Database v4.0. Available at: <https://circularecology.com/embodied-carbon-footprint-database.html>
- Ref 16-27** Environment Agency (2025). 2024 Waste Data Interrogator – Wastes Received – Version 1. Available at: 2024 Waste Data Interrogator - data.gov.uk
- Ref 16-28** Environment Agency (2025). Historic Landfill Sites. Available at: <https://www.data.gov.uk/dataset/17edf94f-6de3-4034-b66b-004ebd0dd010/historic-landfill-sites1>
- Ref 16-29** Environment Agency (2025). Permitted Waste Sites – Authorised Landfill Site Boundaries. Available at: <https://www.data.gov.uk/dataset/ad695596-d71d-4cbb-8e32-99108371c0ee/permited-waste-sites-authorised-landfill-site-boundaries1>
- Ref 16-30** Defra (2025). UK Statistics on waste. Available at: <https://www.gov.uk/government/statistics/uk-waste-data/uk-statistics-on-waste>
- Ref 16-31** WRAP (2007). Waste Recovery Quick Wins. Improving Recovery Rates Without Increasing Costs. No longer available online.

17. Climate Change

17.1 Introduction

- 17.1.1 This chapter addresses both the potential for likely significant effects to the climate as a result of the Proposed Development and the effects on the Proposed Development as a result of climate change.
- 17.1.2 To align with the requirements of the EIA Regulations' (Ref 17-1), consideration has been given within this chapter to the following aspects of climate change assessment:
- Greenhouse Gas (GHG) Impact Assessment: The effects on the climate of GHG emissions arising from the Proposed Development over its lifetime, including how it would affect the ability of government to meet its carbon reduction targets;
 - Climate Change Resilience (CCR) Assessment: The resilience of the Proposed Development to future climate change impacts; and
 - In-combination Climate Change Impact (ICCI) Assessment: The combined impact of the Proposed Development and future climate change on receptors in the surrounding environment.

17.2 Legislation, Policy and Guidance

- 17.2.1 A brief overview of the policy, legislative and guidance relevant to the climate change assessment have been reviewed and summarised below.

Table 17-1: Legislation Relevant to Climate Change

Legislation
United Nations Framework Convention on Climate Change Paris Agreement (UNFCCC, 2016) (Ref 17-2)
UK Nationally Determined Contribution (Ref 17-3)
Climate Change Act 2008 (Ref 17-4) and Climate Change Act (2050 Target Amendment Order 2019) (Ref 17-5)
Carbon Budget Order 2011 (Ref 17-13): Sets the carbon budget total for the Fourth (2023-2027) Carbon Budget period
Carbon Budget Order 2016 (Ref 17-14): Sets the carbon budget total for the Fifth (2028-2032) Carbon Budget period
The Carbon Budget Order 2021 (Ref 17-15): Sets the carbon budget total for the Sixth (2033-2037) Carbon Budget period
The Infrastructure Planning (Environmental Impact Assessment) Regulations ('the EIA Regulations') (Ref 17-1)

Table 17-2: National Planning Policy Relevant to Climate Change

National Planning Policy
Overarching National Policy Statement for Energy (EN-1) (DESNZ, 2024) (Ref 17-6)

National Planning Policy
The National Planning Policy Framework (Ministry of Housing, Communities and Local Government (MHCLG), 2024) (Ref 17-7)
National Planning Policy Guidance on Climate Change (MHCLG, 2019) (Ref 17-8)
Net Zero Strategy (Department for Business, Energy & Industrial Strategy (BEIS), 2021) (Ref 17-9)
Industrial Decarbonisation Strategy (DEZNZ and BEIS (2021)) (Ref 17-29)
Modern Industrial Strategy 2025 (Department for Business and Trade) (Ref 17-30)

Table 17-3: Standards and Guidance Relevant to Climate Change

Relevant Standards and Guidance
UK Carbon Budget Delivery Plan (Ref 17-26)
Carbon Capture, Usage and Storage Policy Paper (2023) (Ref 17-27)

17.3 Defining the Study Area

GHG Impact Assessment

- 17.3.1 The Study Area for the GHG impact assessment covers all direct GHG emissions arising from activities undertaken within the Scoping Boundary during the construction, operation, and decommissioning of the Proposed Development. It also includes indirect emissions embedded within the construction materials arising as a result of the energy used for their production, as well as emissions arising from the transportation of materials, waste and construction workers.
- 17.3.2 The Study Area also includes activities that may be avoided or displaced as a result of the Proposed Development, including consideration of the emissions which are expected to be avoided as a result of the delivery of the wider Project, as discussed in Section 1.2.
- 17.3.3 The environmental impact associated with GHG emissions is a national and global issue. Consequently, the potential significance of the Proposed Development's lifecycle GHG emissions will be assessed by comparing the estimated GHG emissions from the Proposed Development against the reduction targets defined in the Climate Change Act 2008 (Ref 4) and associated five-year, legally binding carbon budgets.

CCR and ICCI Assessment

- 17.3.4 The Study Area for the CCRA and ICCI will encompass the temporary and completed works that make up the Proposed Development.
- 17.3.5 The Study Area for the ICCI assessment will be determined by the EIA topic assessments, as described in other chapters of this EIA Scoping Report and to be reported in the ES. The other relevant topic chapters include:
- Chapter 5: Air Quality;
 - Chapter 6: Biodiversity;
 - Chapter 7: Landscape and Visual;
 - Chapter 8: Traffic and Movement;

- Chapter 9: Noise and Vibration;
- Chapter 10: Historic Environment;
- Chapter 11: Water Environment and Flood Risk;
- Chapter 12: Marine Environment
- Chapter 13: Geology and Ground Conditions;
- Chapter 14: Socio-economics,
- Chapter 15: Human Health;
- Chapter 16: Materials and Waste; and
- Chapter 18: Major Accidents and Disasters.

17.4 Baseline Environment

17.4.1 The approach for determining the baseline for the CCRA, GHG and ICCI assessments is presented in Table 17-4, Table 17-5 and Table 17-6 below.

Table 17-4: Lifecycle GHG Baseline Environment

Lifecycle GHG Baseline Environment
Baseline The baseline for the GHG assessment will include all existing emissions within the site boundary, including the emissions associated with any activities from existing infrastructure relevant to the Proposed Development, including the existing cement and lime manufacturing facilities. Where available, data will be used to quantify these GHG emissions. However, given the scale of the Proposed Development, the GHG assessment will focus on developing a 'business as usual' scenario that represents current operations, against which the Proposed Development will be assessed. The specific infrastructure included and the practical approach for gathering this data will be defined at PEIR stage. Where data is unavailable, benchmarks and estimates will be used based on professional judgement.
Sensitive Receptors The receptor for the lifecycle GHG impact assessment is the global climate. To enable significance evaluation of the estimated GHG emissions arising from the site boundary, the UK national carbon budgets will be used as a proxy for the global climate. GHG emissions will be contextualised against the relevant UK 5-year carbon budget, and associated reduction targets for the appropriate timeframe for each project stage (construction, operation, decommissioning).

Table 17-5: Climate Change Risk Baseline Environment

Lifecycle GHG Baseline Environment
Baseline The baseline for the CCRA is the current and projected climate conditions at the Proposed Development site. As the Proposed Development encompasses a wide geographical area, the CCRA historic and projection climate data will be sourced from the meteorological

Lifecycle GHG Baseline Environment
stations closest to the individual components of the Proposed Development (including the Tarmac Capture Facility, Buxton Lime Capture Facility, Holcim Capture Facility, Peak Cluster Pipeline and Coastal AGI to MLWS Pipeline). The baseline for the CCRA will be developed by based on historic climate data obtained from the Met Office website, recorded at the closest meteorological station to each individual component of the Proposed Development, for the period 1981-2010. Given the length of the pipeline, we will take data from stations at points along the pipeline and review whether they are sufficiently similar to treat as the same.
Sensitive Receptors
The receptor for the CCRA is the Proposed Development itself, including workers, infrastructure, and visitors.

Table 17-6: In-Combination Climate Impact Assessment Baseline Environment

In-Combination Climate Baseline Environment
Baseline
The baseline for the ICCI assessment is the current conditions without the Proposed Development, as defined by the other environmental disciplines covered in this Scoping Report, including Air Quality, Biodiversity, Traffic & Transport, Noise & Vibration, Historic Environment, Water Environment & Flood Risk, Geology & Ground Conditions, Social-economic, Human Health, Materials & Waste, and Major Accidents & Disaster.
Sensitive Receptors
The receptor for the ICCI assessment will be as defined by the assessments undertaken by the other environmental disciplines.

17.5 Planned Surveys

- 17.5.1 No surveys are planned as part of the climate change considerations, but engagement will be undertaken with relevant environmental disciplines and the engineering design team to discuss the climate change assessment and identify mitigation measures for incorporation into the design of the Proposed Development.

17.6 Identification of Potential Effects

- 17.6.1 Key aspects of the Proposed Development that may affect climate change are presented below:

GHG Impact Assessment

- 17.6.2 For the purposes of this assessment, it has been considered that any increase in GHG emissions compared to the baseline has the potential to have an impact due to the high sensitivity of the receptor (global climate) to increases in GHG emissions. This is in line with the IEMA guidance (Ref 10), which states that all GHG emissions have the potential to be significant.
- 17.6.3 The application of the standard EIA significance criteria is not considered to be appropriate for climate change mitigation assessments. GHG impacts will be put into context in terms of their impact on the UK's five-year carbon budgets, which set legally binding targets for GHG emissions.

The specific nature of the Proposed Development itself will also be taken into account as appropriate once the Proposed Development is operational.

- 17.6.4 The key anticipated GHG emission sources during the construction, operation and decommissioning phase are set out in Table 17-7. This approach is consistent with the principles set out in the BS EN 15804 (Ref 17-20), PAS 2050 (Ref 17-21), PAS 2080 (Ref 17-22) and IEMA guidance (Ref 17-10). The GHG assessment will consider the direct impact of the proposed construction, operation and decommissioning of the works, against the baseline scenario.

Table 17-7: Potential Sources of GHG Emissions from the Proposed Development

Lifecycle stage	Activity	Primary emissions sources	Scoped In/Out
A0 Pre-construction	Land and associated fees/advice	Activities in A0 Pre-Construction include, but are not limited to, non-physical processes before construction, such as preliminary studies, impact assessments, risk assessments, stakeholder engagement, design and technical studies, product/material tests, site surveys and acquisition of land and design	In
Product stage	Use of products and/or materials required to build the proposed pipeline and associated infrastructure	Embodied GHG emissions from energy use in the extraction of materials and manufacture of components and equipment. GHG emissions from the transportation of products and materials during their processing and manufacture.	In
Construction stage	Transportation of construction materials to the site. Due to the nature of the equipment required, this could require shipment of certain aspects over significant distances. On-site construction activity Transport of construction workers	Transport of construction materials from the manufacturing facility is included under the construction process stage. Due to the nature of the equipment, this could require shipment of certain aspects over considerable distances. GHG emissions from energy (electricity, fuel, etc.) consumption for plant and vehicles, and generators on site.	In

Lifecycle stage	Activity	Primary emissions sources	Scoped In/Out
	Disposal of any waste generated during the construction processes	Fuel consumption from transport of materials to site (where these are not included in embodied GHG emissions). GHG emissions from fuel use for worker commuting. GHG emissions from transportation and disposal of waste. Emissions resulting from disturbance of vegetated land and the loss or gain of carbon stocks as a result of the Proposed Development's construction.	
Operation stage	Energy use from operation of the Proposed Development Maintenance activities Captured CO₂ emissions	Emissions arising from fuel consumed by maintenance vehicles and plant. Embodied GHG emissions within the materials used for maintenance and replacement of assets. Grid electricity use during operation of the development (e.g. lighting/signs). Emissions arising from the production of cement and lime at the factories, and that avoided as a result of the Proposed Development.	In
Decommissioning Stage	On-site decommissioning activity. Transportation and disposal of waste materials. Transportation of workers.	Energy (e.g., electricity, fuel) consumption from plant, vehicles, and generators, within the site. GHG emissions from disposal and transportation of waste. GHG emissions from the transportation of workers to the site.	In

CCR Assessment

- 17.6.5 The climate change resilience review will qualitatively assess the Proposed Development's resilience to climate change. This will be completed in liaison with the Proposed Development's

design team and the other EIA technical disciplines by considering the climate projections for the geographical location and timeframe of the Proposed Development.

- 17.6.6 For all three phases (construction, operation and decommissioning), climate parameters relevant to the climate change resilience review are detailed in Table 17-8 below.

Table 17-8: Potential Scoped in Effects to Climate Change Risk

Parameter	Rational for scoping conclusion	Scoped In/Out
Extreme weather events	The Proposed Development may be vulnerable to extreme weather events such as heatwaves, drought, wildfires, storm damage to structures and assets.	In
Temperature	Increased temperatures may increase the cooling requirements of the Proposed Development and could impact the structural integrity of materials. Pipelines can expand and contract with temperature changes. Consideration will need to be given to the pipeline management systems and their ability to manage temperature variations within an operating range.	In
Precipitation	The Proposed Development may be vulnerable to changes in precipitation such as damage to structures, materials, and drainage systems during periods of heavy precipitation. Consideration will need to be given to the impact of coastal, fluvial and ground water flooding on the Proposed Development. CO ₂ is more buoyant than water, so consideration will need to be given to the risk of flooding on pipeline infrastructure. The Proposed Development may also be vulnerable to ground slippage or heaving as a result of changing wetting and drying cycles.	In
Wildfire	The wildfire hazard is classified as medium according to the information that is currently available to the Think Hazard tool (Ref 16). This means that there is between a 10% and 50% chance of experiencing weather that could support a hazardous wildfire that may pose some risk to the Proposed Development.	In
Wind	There is currently no evidence to suggest that climate change is increasing high wind events. The UK Climate Report (Ref 17-25) states that there are “no compelling trends in storminess when considering maximum gust speeds over the last five decades.” However, due to the lack of credible data, the effects of increased wind strength will be considered qualitatively.	In

Parameter	Rational for scoping conclusion	Scoped In/Out
Sea level rise	Although most of the Proposed Development is situated inland, the western section of the pipeline and the Coastal AGI are positioned close to coastal regions that may be vulnerable to flooding from the Irish Sea. The risk of coastal flooding and erosion will therefore be considered.	In
Ocean acidification	The pipeline in the intertidal area (up to MLWS Pipeline) and associated metal infrastructure may be vulnerable to the impacts of ocean acidification. Chemical changes to seawater can have an impact on corrosion and alter the speciation of metals, impacting solubility and toxicity.	In

17.6.7 Based on the above, the vulnerability assessment is proposed to be scoped into the EIA for the construction, operation and decommissioning stages. The design of the Proposed Development will be assessed to understand how potential risks arising from future climate change as an increase in the frequency and severity of precipitation and increased temperatures may impact the Proposed Development's operation.

17.6.8 A statement will be provided within the ES to describe how the Proposed Development will be adapted to improve its resilience to future climate conditions.

ICCI Assessment

17.6.9 The ICCI assessment will consider how the resilience of various receptors in the surrounding environment (such as local waterways or local heritage assets etc.) are affected by the Proposed Development in combination with future climatic conditions. For all three phases (construction, operation and decommissioning), the climate parameters scoped into the ICCI assessment are presented below.

- Extreme weather events;
- Temperature;
- Precipitation;
- Wildfire;
- Sea level rise;
- Wind; and
- Ocean acidification.

17.6.10 See Table 17-8 for the rationale behind the scoping conclusion of the climate parameters.

17.7 Scope and Methodology

17.7.1 This section outlines the scope and methodology that will be employed for assessing the likely significant effects associated with climate change.

Scope

GHG Impact Assessment

- 17.7.2 The GHG baseline will be established by quantifying any GHG emissions from the existing Site which will comprise GHG emissions from sources within the boundary of the site (i.e. the baseline is assuming that the Proposed Development does not progress).
- 17.7.3 Plate 17-1 below shows the lifecycle stages of the civil engineering works assessment within the PAS 2080 Guidance (Ref 17-22). This has been used to inform the scope and reporting framework for the baseline assessment.

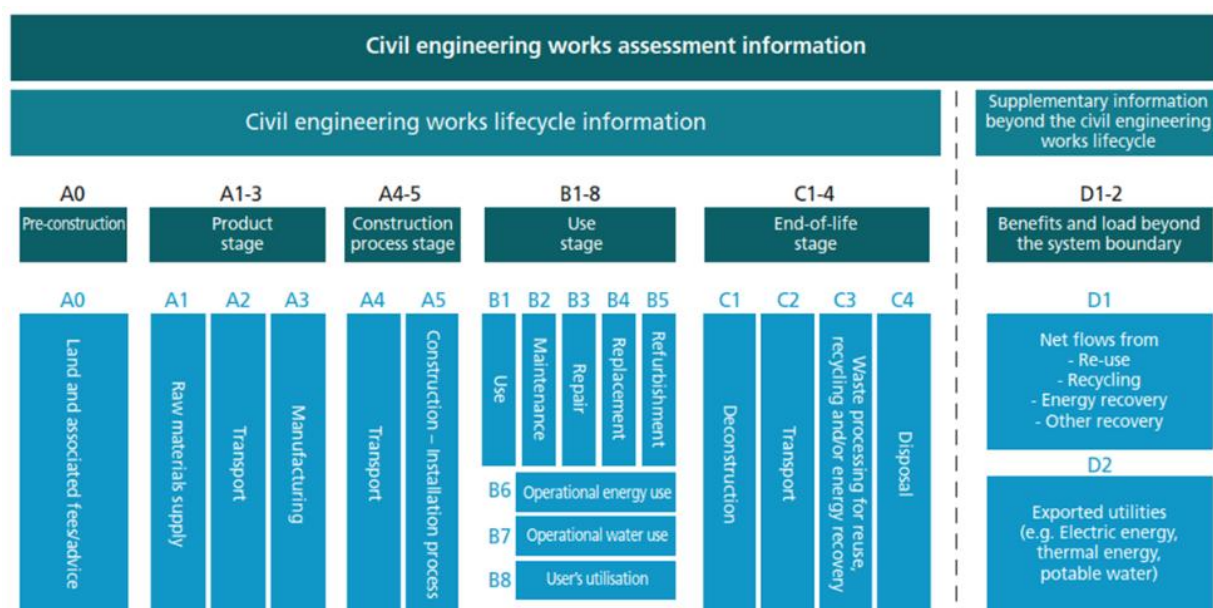


Plate 17-1: Lifecycle stages of civil engineering works assessment (PAS 2080:2023)

- 17.7.4 It is anticipated that the baseline assessment will quantify emissions associated with the B1 stage to account for emissions arising from the use of the cement and lime manufacturing facilities.

CCR Assessment

- 17.7.5 The CCRA will consider how resilient the Proposed Development is to current and projected future climate hazards by identifying likely changes to the climate and potential climate hazards over the lifecycle of the Proposed Development.
- 17.7.6 As the receptor for the CCRA is the Proposed Development itself (including workers and infrastructure), the current baseline will be established by understanding the historic/current climate in the location of the Proposed Development by reviewing historic climate data obtained from the Met Office website (Ref 17-18).
- 17.7.7 The CCRA will provide commentary on how the Proposed Development will be resilient to future climate conditions using the UKCP18 projections (Ref 17-19).

ICCI Assessment

- 17.7.8 The ICCI assessment will consider how the resilience of various receptors in the surrounding environment (such as local waterways or local heritage assets etc.) are affected by the Proposed Development in combination with future climatic conditions.
- 17.7.9 The technical specialists in the applicable technical chapters of this Scoping Report define the ICCI assessment receptors within their assessments.

Methodology

GHG Impact Assessment

- 17.7.10 In order to quantify the magnitude of emissions, GHG-emitting activities need to be identified, and emissions quantified. The key anticipated GHG emission sources during Proposed Development's construction, operation and decommissioning phase are set out in Table 17-7. This approach is consistent with the principles set out in IEMA guidance (Ref 17-10), BS EN 15804 (Ref 17-21) and PAS 2080 (Ref 17-22). The GHG assessment will consider the direct impact of the proposed construction and operation of the works against the baseline scenario.
- 17.7.11 GHG emissions will be assessed using a calculation-based methodology as per the equation below:

$$\text{Activity data} \times \text{GHG emissions factor} = \text{GHG emissions value}.$$
- 17.7.12 A set of standard data quality principles will be applied so that the results from the GHG assessment are as accurate and representative as possible:
- Age: Activity data and GHG emissions factors applicable to the study period will be used.
 - Geography: Activity data will reflect the design of the Proposed Development. GHG emissions factors will be representative of the UK construction industry and UK transport sector.
 - Technology: The default solution will be to apply data which is representative of the UK construction industry and transport sector. However, technology specific data may be used for the purpose of developing scenarios of the future.
 - Methodology: Activity data will be gathered from the Proposed Development's engineering and design teams where available to enable consistency and completeness of data collection.
 - Competency: Data gaps will be addressed through, for instance, peer reviewed papers (published in recognised journals) or industry specific literature (e.g. UK construction trade associations). GHG emissions factors from a range of sources will be used: EPDs (adhering to BS EN 15804 standard), LCA tools (aligned with best practice), and industry specific and UK Government sources.
- 17.7.13 In line with applicable guidelines from the World Business Council for Sustainable Development (WBCSD)/ World Resources Institute (WRI) Greenhouse Gas Protocol initiative (Ref 17-12), the GHG emissions study will be reported as tonnes of carbon dioxide equivalent (tCO₂e) and consider the seven Kyoto Protocol gases:
- Carbon-dioxide (CO₂);
 - Methane (CH₄);
 - Nitrous oxide (N₂O);
 - Hydrofluorocarbons (HFCs);
 - Perfluorocarbons (PFCs);
 - Sulphur hexafluoride (SF₆); and
 - Nitrogen Trifluoride (NF₃).
- 17.7.14 Where insufficient data is available to quantify GHG emissions industry benchmarks or approximations based on other similar projects will be used.

- 17.7.15 The global climate has been identified as the receptor for the purposes of the lifecycle GHG emissions impact assessment. However, to enable significance evaluation of the estimated GHG emissions arising from the Proposed Development, the UK national carbon budgets will be used as a proxy for the global climate. GHG emissions will be contextualised against the relevant UK 5-year carbon budget, and associated reduction targets for the appropriate timeframe for each project stage (construction, operation, decommissioning).
- 17.7.16 The UK is currently in the 4th Carbon Budget period, which runs from 2023 to 2027, as detailed in Table 17-7. The 3rd, 4th, and 5th Carbon Budgets reflect the previous 80% reduction target by 2050. The 6th Carbon Budget is the first to align with the legislated 2050 net zero commitment.
- 17.7.17 The Climate Change Committee (CCC) released their 7th Carbon Budget recommendation in February 2025 and advised the UK Carbon Budget to be set at 535 MtCO₂e, which is expected to be agreed in Parliament and set into UK law. However, this depends on agreement with the UK Government and is therefore subject to change. Additionally, the CCC's feedback may also evolve based on input from the UK Government.
- 17.7.18 The CCC Balanced Net Zero Pathway is recommended to be divided into five-year periods post-2037 to match the previous six legally binding UK national carbon budgets. The proposed carbon budget periods derived from the net zero pathway encompass the 7th, 8th, and 9th indicative budget periods up to 2050 in line with the UK's 1.5°C trajectory as detailed in Table 17-9.

Table 17-9: UK Carbon Budgets

UK Carbon Budget	Total Budget (MtCO ₂ e)	Indicative Carbon Budgets based upon CCC's Balanced Net Zero Pathway (MtCO ₂ e)
3rd (2018-2022)	2,544	-
4th (2023-2027)	1,950	-
5th (2028-2032)	1,725	-
6th (2033-2037)	965	-
7th (2038-2042)	-	535
8th (2043-2047)	-	220
9th (2048-2050)	-	20

- 17.7.19 It is noted that the supplementary carbon budgets beyond 2037 have not been formally adopted by the UK Government or ratified by Parliament and can only be used as an indicative measure to contextualise the Proposed Development's progress toward the national net zero trajectory.
- 17.7.20 Peak Cluster proposes to capture over 3 million tonnes per annum (MTPA) of CO₂ from the four lime and cement manufacturing sites based in and around the Peak District, preventing it from being released into the atmosphere. As such, consideration will be given to the emissions which are expected to be avoided from cement and lime manufacturing as a result of the delivery of the wider Proposed Development.
- 17.7.21 In line with IEMA guidance (Ref 17-10), the sensitivity of the receptor, the UK carbon budget (as a proxy for the global climate), has been defined as high. The rationale is as follows:
- GHG emission impacts could compromise the UK's Carbon Budget Delivery Plan (Ref 17-26) sectoral construction and Net-Zero Pathways and, therefore, the ability to meet its future carbon reduction trajectory;

- Any additional GHG impacts could compromise the wider UK's ability to reduce its GHG emissions and, therefore, the ability to meet its future legally binding carbon budgets;
- The extreme importance of limiting global warming to below 2°C above industrial levels, while pursuing efforts to limit such warming to 1.5°C as set out in the Paris Agreement (Ref 17-2) and a recent report by the Intergovernmental Panel on Climate Change (IPCC) highlighted the importance of limiting global warming below 1.5°C; and
- Disruption to the global climate already has diverse and wide-ranging impacts on the environment, society, economic and natural resources. Known effects of climate change include increased frequency and duration of extreme weather events, temperature changes, rainfall and flooding, and sea level rise and ocean acidification. These effects are largely accepted to be negative, profound, global, likely, long-term to permanent, and are transboundary and cumulative from many global actions.

17.7.22 As per IEMA guidance (Ref 17-10), all GHG emissions are considered capable of being significant. To help contextualise the level of significance, these emissions will be compared to the UK carbon budgets (Ref 17-24). The method proposed to determine the significance of GHG emissions is summarised in Table 17-8.

Table 17-10: IEMA Criteria Used to Determine the Significance of GHG Emissions

Effect Significance Level	Effects	Description	Example in the guidance
Significant Adverse	Major Adverse	A project that follows a 'business-as-usual' or 'do minimum' approach and is not compatible with the UK's net zero trajectory, or accepted aligned practice or area-based transition targets. It is down to the practitioner to differentiate between the 'level' of significant adverse effects e.g. 'Moderate' or 'Major' adverse effects.	The project's GHG impacts are not mitigated or are only compliant with do-minimum standards set through regulation, and do not provide further reductions required by existing local and national policy for projects of this type. A project with major adverse effects is locking in emissions and does not make a meaningful contribution to the UK's trajectory towards net zero
	Moderate Adverse		The project's GHG impacts are partially mitigated and may partially meet the applicable existing and emerging policy requirements but would not fully contribute to decarbonisation in line with local and national policy goals for projects of this

Effect Significance Level	Effects	Description	Example in the guidance
			type. A project with moderate adverse effects falls short of fully contributing to the UK's trajectory towards net zero.
Not Significant	Minor Adverse	A project that is compatible with the budgeted, science based 1.5°C trajectory (in terms of rate of emissions reduction) and which complies with up-to-date policy and 'good practice' reduction measures to achieve that. It may have residual emissions but is doing enough to align with and contribute to the relevant transition scenario, keeping the UK on track towards net zero by 2050 with at least a 78% reduction by 2035 and thereby potentially avoiding significant adverse effects.	The project's GHG impacts would be fully consistent with applicable existing and emerging policy requirements and good practice design standards for projects of this type. A project with minor adverse effects is fully in line with measures necessary to achieve the UK's trajectory towards net zero.
	Negligible	A project that achieves emissions mitigation that goes substantially beyond the reduction trajectory, or substantially beyond existing and emerging policy compatible with that trajectory and has minimal residual emissions. This project is playing a part in achieving the rate of transition required by nationally set policy commitments.	The project's GHG impacts would be reduced through measures that go well beyond existing and emerging policy and design standards for projects of this type, such that radical decarbonisation or net zero is achieved well before 2050. A project with negligible effects provides GHG performance that is well 'ahead of the curve' for the trajectory towards net zero and has minimal residual emissions.
Beneficial	Beneficial	A project that causes GHG emissions to be avoided or removed from the	The project's net GHG impacts are below zero and it causes a reduction in

Effect Significance Level	Effects	Description	Example in the guidance
		atmosphere. Only projects that actively reverse (rather than only reduce) the risk of severe climate change can be judged as having a beneficial effect.	atmospheric GHG concentration, whether directly or indirectly, compared to the without-project baseline. A project with beneficial effects substantially exceeds net zero requirements with a positive climate impact.

CCR Assessment

- 17.7.23 An assessment of the resilience of the Proposed Development to climate change will be undertaken to identify potential climate change hazards and to consider their potential consequence and likelihood of impact occurrence, taking account of the measures incorporated into the design of the Proposed Development.
- 17.7.24 The types of receptors considered vulnerable to climate change are:
- Construction phase receptors, e.g. workforce, plant and machinery; and
 - Assets associated with the Proposed Development and their operation, maintenance and refurbishment, e.g. electrical equipment, heating and cooling facilities, pavements and structures, pipelines, earthworks and drainage technology.
- 17.7.25 The CCRA will provide commentary on the resilience of the Proposed Development to the predicted future climate change based on UKCP18 projection data (Ref 17-19). The UKCP18 projections will be collated for multiple 25 km grid cells to account for the wide geographic span of the Proposed Development and used to examine future climate parameters.
- 17.7.26 UKCP18 uses a wide range of possible scenarios, classified as Representative Concentration Pathways (RCPs), to inform differing future emission trends. These RCPs "... specify the concentrations of greenhouse gases that will result in total radiative forcing increasing by a target amount by 2100, relative to preindustrial levels." There are four primary RCPs, each representing different levels of GHG emissions and their corresponding impacts on climate change (Ref 27):
- RCP2.6: This pathway aims to limit global warming to below 2°C above pre-industrial levels, representing a stringent mitigation scenario;
 - RCP4.5: This is an intermediate scenario, assuming moderate mitigation efforts and leads to stabilisation of radiative forcing. Under this scenario, emissions peak around 2040 before declining;
 - RCP6: This pathway represents a world that recognises climate challenges but does not implement the most aggressive mitigation scenarios. Under this pathway, emissions peak around 2060 before declining; and
 - RCP8.5: This pathway assumes high emissions throughout the 21st century leading to significant climate impacts. It represents a future with minimal efforts to reduce emissions.

- RCP8.5 will be used for the purposes of this assessment as worst-case, as this predicts a high-emissions or 'business-as-usual' scenario.

17.7.27 The climate projection data will provide a probabilistic indication of how global climate change is likely to affect the Proposed Development defined climate variables and time periods. The Intergovernmental Panel Climate Change (IPCC) Sixth Assessment Report (AR6) Sea Level Projection Tool (Ref 17-17) and ThinkHazard (Ref 17-16) will also be used to determine other projected trends/impacts.

17.7.28 The approach outlined below is aligned with existing guidance, including IEMA guidance (Ref 17-11). Climate parameters to be considered in the CCRA across all lifecycle stages include the following:

- Extreme weather events;
- Flood risk;
- Wildfires;
- Droughts;
- Temperature change;
- Wind;
- Precipitation change;
- Sea level rise; and
- Ocean acidification.

17.7.29 The following key terms and definitions relating to the CCRA will be used:

- *Climate hazard* – a weather or climate related event, which has the potential to do harm to environmental or community receptors or assets, for example, increased winter precipitation;
- *Climate change impact* – an impact from a climate hazard which affects the ability of the receptor or asset to maintain its function or purpose; and
- *Consequence* – any effect on the receptor or asset resulting from the climate hazard having an impact.

17.7.30 The likelihood of a climate impact occurring is based on the likelihood of the hazard occurring combined with the vulnerability of the Proposed Development, using professional judgement and in discussion with the design team. Embedded mitigation measures will also be taken into account, and a likelihood rating will be assigned as described in Table 17-9.

17.7.31 Following the identification of climate hazards, the likelihood and consequences will be assessed according to Table 17-9 and Table 17-10 respectively. The categories and descriptions are based on the IEMA climate change resilience and adaptation guidance (Ref 17-11).

Table 17-11: Criteria Used to Determine the Likelihood of an Impact Occurring for the CCRA

Likelihood	Qualitative	Quantitative
Rare	Highly unlikely to occur	5%
Unlikely	Unlikely to occur	20%
Moderate	As likely to occur as not	50%

Likelihood	Qualitative	Quantitative
Likely	Likely to occur	80%
Almost certain	Very likely to occur	95%

Table 17-12: Criteria Used to Determine the Level of Consequence of a Climate Change Impact

Risk Area	Insignificant	Minor	Moderate	Major	Catastrophic
Asset damage, engineering, operational	Impact can be absorbed through normal activity.	Adverse event that can be absorbed by taking business continuity actions.	A serious event that requires additional emergency business continuity actions.	A critical event that requires extraordinary/emergency business continuity action.	Disaster with the potential to lead to shut down or collapse or loss of the asset/network.
Health and safety	First aid case.	Minor injury, medical treatment.	Serious injury or lost work.	Major or multiple injuries, permanent injury or disability.	Single or multiple fatalities.
Environment	No impact on baseline environment. Localised in the source area. No recovery required.	Localised within site boundaries. Recovery measurable within one month of impact.	Moderate harm with possible wider effect. Recovery in one year.	Significant harm with local effect. Recovery longer than one year. Failure to comply with environmental regulations/consent.	Significant harm with widespread effect. Recovery longer than one year. Limited. Prospect of full recovery.
Social (1)	No negative social impact.	Localised, temporary social impacts.	Localised, long term social impacts.	Failure to protect poor or vulnerable groups. National, long term social impacts.	Loss of social license to operate. Community protests.
Financial*	x% IRR < 2% of turnover.	x% IRR 2-10% of turnover.	x% IRR 10-25% of turnover.	x% IRR 25-50% of turnover.	x% IRR > 50% of turnover.
Reputational	Localised, temporary impact on public opinion.	Localised, short-term impact on public opinion.	Local, long-term impact on public opinion with	National, short-term impact on public opinion.	National, long-term impact with potential to

Risk Area	Insignificant	Minor	Moderate	Major	Catastrophic
		public opinion.	adverse local media coverage.	public opinion. negative national media coverage.	affect the stability of the government
Cultural heritage and cultural premises	Insignificant	Short term impact. Possible recovery or repair.	Serious damage with wider impact to tourism industry.	Significant damage with national and international impact.	Permanent loss with resulting impact on society.
(1) Including groups that depend on natural resources for their income/livelihoods and cultural heritage (even if not considered poor) and groups considered poor and vulnerable (and often that have less capacity to adapt) as well as persons with disabilities and older persons. *Internal Rate of Return – a financial metric used to estimate the profitability of an investment. N.B. The ratings and values suggested here are illustrative. The Proposed Development promoter and climate-proofing manager may choose to modify them. Example indicators – other indicators that may be used including costs of immediate/ long-term emergency measures; restoration of assets; environmental restoration; indirect costs on the economy, indirect social costs.					

- 17.7.32 Engagement will be undertaken with relevant environmental disciplines, particularly Geotechnical and Water teams as well as the design team to discuss the CCRA and identify mitigation measures for incorporation into the design of the Proposed Development.
- 17.7.33 The significance of the CCRA findings will be determined as a function of the likelihood of a climate change impact occurring and the consequence to the receptor if the impact occurs. Effect significance criteria will be assigned in accordance with the matrix as detailed in Table 17-13. The assessment will take into account confirmed design and mitigation measures (referred to as embedded mitigation).

Table 17-13: Climate Change Impacts Significance Matrix (Where S is Significant, and NS is Not Significant)

Likelihood	Consequence				
	Insignificant	Minor	Moderate	Major	Catastrophic
Rare	Low (NS)*	Low (NS)	Medium (NS)	High (S)*	Extreme (S)
Unlikely	Low (NS)	Low (NS)	Medium (NS)	High (S)	Extreme (S)
Moderate	Low (NS)	Medium (NS)	High (S)	Extreme (S)	Extreme (S)
Likely	Medium (NS)	High (S)	High (S)	Extreme (S)	Extreme (S)
Almost certain	High (S)	High (S)	Extreme (S)	Extreme (S)	Extreme (S)

ICCI Assessment

- 17.7.34 The Study Area and receptors for the ICCI assessment will be determined by the EIA topic assessments, as described in other technical sections of this report.
- 17.7.35 The ICCI assessment will consider how the resilience of various receptors in the surrounding environment (such as local waterways or local heritage assets etc.) are affected by the Proposed Development in combination with future climatic conditions as sourced from UKCP18 projections. The impacts are considered for the construction, operation and decommissioning phases of the Proposed Development.
- 17.7.36 The receptors for the ICCI assessment will be those the Proposed Development will impact. These impacts will be assessed in liaison with the technical specialists responsible for preparing the applicable technical chapters.
- 17.7.37 Once potential ICCIs have been identified in relation to the Proposed Development, the likelihood of their occurrence during construction, operation and decommissioning phases is categorised. This is the same process as undertaken for the CCRA.
- 17.7.38 In consideration of the likelihood of the climate risk occurring, and the sensitivity of the receptor, the likelihood of a climate impact occurring to the receptor is then defined. This includes consideration of any embedded mitigation measures and good practice. These classifications are defined in Table 17-14.

Table 17-14: Likelihood of a Climate Risk Occurring

Likelihood of event	Qualitative description	Description (probability of occurrence)
Very likely	Likely that the event will occur many times (reoccurs frequently)	>90-100% probability that the impact will occur
Likely	Likely that the event will occur sometimes (reoccurs infrequently).	>66-90% probability that the impact will occur
Possible, about as likely as not	Possible that the event will occur (has occurred rarely)	>33-66% probability that the impact will occur
Unlikely	Unlikely that the event will occur (not known to have occurred).	>10-33% probability that the impact will occur
Very unlikely	Almost inconceivable that the event will occur.	0-10% probability that the impact will occur

- 17.7.39 The likelihood of a climate risk occurring and the likelihood of a climate impact to a receptor is then combined to determine the likelihood of an ICCI occurring. This is illustrated in Table 17-15.

Table 17-15: Level of Likelihood of an ICCI Occurring

Level of Likelihood of climate impact occurring	Definition of Likelihood
High	Likelihood of climate hazard occurring is high and impact is always/ almost always going to occur.

Level of Likelihood of climate impact occurring	Definition of Likelihood
Moderate	Likelihood of climate hazard occurring is high and impact occurs often or the likelihood of climate hazard occurring is moderate and impact is likely to occur always/ almost always.
Low	Likelihood of climate hazard occurring is high, but impact rarely occurs or the likelihood of climate hazard occurring is moderate and impact sometimes occurs or the likelihood of climate hazard occurring is low and impact is likely to occur always/ almost always.
Negligible	All other eventualities – highly unlikely but theoretically possible.

- 17.7.40 Once the likelihood of an ICCI has been identified the assessment then considers how this will affect the significance of the identified effects.
- 17.7.41 The ICCI consequence criteria are defined in Table 17-16 below and are based on the change to the significance of the impact already identified by the environmental discipline. To assess the consequence of an ICCI each discipline will assign a level of consequence to an impact based on the criteria description and their discipline assessment methodology.

Table 17-16: Consequence Criteria for an ICCI Assessment

Consequence	Consequence criteria
High	The climate change parameter in-combination with the effect of the Proposed Development causes the significance of the impact of the Proposed Development on the resource/receptor, as defined by the topic, to increase from negligible, low, or moderate to major.
Moderate	The climate change parameter in-combination with the effect of the Proposed Development causes the effect defined by the topic to increase from negligible or low, to moderate.
Low	The climate change parameter in-combination with the effect of the Proposed Development, causes the significance of effect defined by the topic, to increase from negligible to low.
Negligible	The climate change parameter in-combination with the effect of the Proposed Development does not alter the significance of the effect defined by the topic.

- 17.7.42 The significance of potential effects is determined using the matrix in Table 17-17. Where an effect has been identified as moderate or high, it will be classed as a likely significant ICCI effect. If likely significant ICCI effects are assessed, then appropriate additional mitigation measures (secondary mitigation) are identified.

Table 17-17: ICCI Significance Criteria (Where S is Significant, and NS is Not Significant)

Level of consequence	Consequence			
	Negligible	Low	Moderate	High
Negligible	NS	NS	NS	NS
Low	NS	NS	NS	S
Moderate	NS	NS	S	S
High	NS	S	S	S

Consultation

17.7.43 Consultation will be undertaken with statutory parties including the EA and the relevant Local Planning Authorities on climate change targets, aims, commitments, other projects, plans and policy that affect climate and baseline data, as well as any known future developments in close proximity to the Proposed Development.

Assumptions and Limitations

17.7.44 It is assumed that necessary quantitative data will be available to inform the GHG assessment. Where quantitative data is not available, reasonable assumptions will be made and agreed upon with the Proposed Development team.

17.7.45 Where it is neither possible to quantify the required data nor to use reasonable assumptions, a qualitative statement will be made on the environmental impact based on professional experience and expertise.

17.7.46 The UKCP18 data is limited to the projected period of 2100. Therefore, climate impacts beyond this time will not be presented in the ES. Due to the uncertainty of climate projection data beyond the end of the century, a general qualitative assessment will be made. The Proposed Development's life cycle will be confirmed during the ES stage to align the CCRA with the appropriate timescales.

17.7.47 Embedded mitigation and adaptation measures will be presented for all the assessment methods discussed in the ES.

Summary of Issues to be scoped in / out

17.7.48 It is proposed that the GHG impact assessment, CCR assessment and ICCI assessment are scoped into the EIA and will be included within the ES to determine the potential for likely significant effects to and from climate change as a result of the construction, operation and decommissioning phases of the Proposed Development.

17.7.49 Table 17-18 presents the proposed scope of the EIA chapter for each assessment; CCR, ICCI and GHG assessments.

17.7.50 Further information on the specific potential effects expected from each assessment is presented in Section 17.6.

17.7.51 Best practice methods and guidance will be used in these assessments, as described within this Chapter.

Table 17-18: Climate Change Assessment Scope

Climate Change Assessment Scope – for Proposed Development				
Scope Scoped in ✓, scoped out ✗	Construction (C), Operation (O), Decommissioning (D)			Rationale
	C	O	D	
GHG Impact Assessment	✓	✓	✓	A GHG assessment will be scoped into the EIA and will be included within the ES to determine the potential for likely significant effects to and from climate change as a result of the construction, operation and decommissioning phases of the Proposed Development.
Climate change resilience review assessments	✓	✓	✓	A CCR assessment will be scoped into the EIA and will be included within the ES to determine the potential for likely significant effects to and from climate change as a result of the construction, operation and decommissioning phases of the Proposed Development.
In-combination climate change	✓	✓	✓	An ICCI assessment will be scoped into the EIA and will be included within the ES to determine the in-combination impacts of climate change on discipline receptors.

17.8 Mitigation

GHG Impact Assessment

- 17.8.1 It is recognised that the Proposed Development intends to capture and store carbon dioxide (CO₂) emissions from the cement and lime facilities within the MNZ carbon dioxide store. The GHG impact assessment for this Proposed Development will consider the indirect emissions which are expected to be avoided as a result of the delivery of the Proposed Development.
- 17.8.2 An Outline CEMP will be submitted as part of the DCO application and would be implemented by the selected Principal Contractor(s) to include a range of best practice construction measures, such as:
- Specification of alternative materials with lower embodied GHG emissions;
 - Low carbon design specifications such as energy-efficient lighting and durable; and
 - Construction materials to reduce maintenance and replacement cycles.
- 17.8.3 The final selection of any mitigation measures, if required, will be detailed as part of the lifecycle GHG impact assessment in the ES. This may include GHG emission mitigation measures concerning construction, operation and decommissioning of the Proposed Development.

CCR Assessment and ICCI Assessment

- 17.8.4 The scope for adapting the Proposed Development to mitigate climate change effects will be determined following the completion of the CCR assessment and ICCI assessment.
- 17.8.5 These will focus on measures to increase the resilience of the Proposed Development to climate change impacts and will be informed by discussions with the design team and the findings of other relevant ES technical assessments. For example, this may include designing surface water drainage systems to ensure flows up to the 1 in 100-year return period can be contained and managed within the construction areas and operational sites, designing the Proposed Development to allow suitable space and airflow between buildings, and measures to reduce the potential for overheating of equipment.

17.9 Summary

- 17.9.1 It is proposed that the GHG impact assessment, CCR assessment and ICCI assessment are scoped into the EIA and will be included within the ES to determine the potential for likely significant effects to and from climate change as a result of the construction, operation and decommissioning phases of the Proposed Development.

17.10 References

- Ref 17-1** HM Government (2017). The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017. Available at: <https://www.legislation.gov.uk/ukxi/2017/572>
- Ref 17-2** United Nations (2015) Paris Agreement. Available at: https://unfccc.int/sites/default/files/english_paris_agreement.pdf
- Ref 17-3** DESNZ (2020). UK's Nationally Determined Contribution updated September 2022. Available at: <https://www.gov.uk/government/publications/the-uks-nationally-determined-contribution-communication-to-the-unfccc>
- Ref 17-4** HM Government (2008). Climate Change Act 2008. Available at: http://www.legislation.gov.uk/ukpga/2008/27/pdfs/ukpga_20080027_en.pdf
- Ref 17-5** HM Government (2019). The Climate Change Act 2008 (2050 Target Amendment) Order 2019. Available at: <https://www.legislation.gov.uk/ukdsi/2019/9780111187654>
- Ref 17-6** Department for Energy Security and Net Zero (DEZNZ) (2024). Overarching National Policy Statement for Energy (EN-1). Available at: <https://www.gov.uk/government/publications/overarching-national-policy-statement-for-energy-en-1>
- Ref 17-7** Ministry of Housing, Communities and Local Government (MHCLG) (2024). National Planning Policy Framework, Available: <https://assets.publishing.service.gov.uk/media/655dc25e046ed400148b9dca/nps-electricity-networks-infrastructure-en5.pdf>
- Ref 17-8** MHCLG (2014). National Planning Practice Guidance: Climate Change. Available at: <https://www.gov.uk/guidance/climate-change>

- Ref 17-9** Department for Business, Energy & Industrial Strategy (BEIS) (2021). Net Zero Strategy: Build Back Greener. Available at: <https://www.gov.uk/government/publications/net-zero-strategy>
- Ref 17-10** IEMA (2022). Environmental Impact Assessment Guide to: Assessing Greenhouse Gas Emissions and Evaluating their Significance. Available at: https://www.iema.net/media/xmgpooopk/2022_iema_greenhouse_gas_guidance_eia.pdf
- Ref 17-11** IEMA (2020). Environmental Impact Assessment Guide to: Climate Change Resilience and Adaptation. Available at: <https://www.iema.net/media/mabhqino/iema-eia-climate-change-resilience-june-2020.pdf>
- Ref 17-12** WRI & WBCSD (2015). The GHG Protocol. A Corporate Accounting and Reporting Standard. Revised Edition (online). Available at: <https://ghgprotocol.org/sites/default/files/standards/ghg-protocol-revised.pdf>
- Ref 17-13** HM Government (2011). Carbon Budget Order 2011. Available at: <https://www.legislation.gov.uk/uksi/2011/1603/made>
- Ref 17-14** HM Government (2016). Carbon Budget Order 2016. Available at: <https://www.legislation.gov.uk/uksi/2016/785/contents/made>
- Ref 17-15** HM Government (2021). The Carbon Budget Order 2021. Available at: <https://www.legislation.gov.uk/ukdsi/2021/9780348222616>.
- Ref 17-16** Global Facility for Disaster Reduction and Recovery (GFDRR) (2020) ThinkHazard.
- Ref 17-17** IPCC (n.d.) IPCC 6th Assessment Report Sea Level Projections. Available at: <https://sealevel.nasa.gov/ipcc-ar6-sea-level-projection-tool>
- Ref 17-18** UK Met Office (2019). UK Climate Averages (Benson). Available at: <https://www.metoffice.gov.uk/research/climate/maps-and-data/uk-climate-averages/gcpjxi1hq>
- Ref 17-19** UK Met Office (2019). UK Climate Projections 2018 (UKCP18). Available at: <https://www.metoffice.gov.uk/research/approach/collaboration/ukcp/index>
- Ref 17-20** BS EN 15804:2012 Sustainability of construction works. Environmental product declarations. Core rules for the product category of construction products.
- Ref 17-21** British Standards Institution (2011). PAS 2050:2011. Specification for the assessment of the life cycle greenhouse gas emissions of goods and services.
- Ref 17-22** British Standards Institution (2023). PAS 2080:2023. Carbon management in buildings and infrastructure. Available at: <https://www.bsigroup.com/en-GB/insights-and-media/insights/brochures/pas-2080-carbon-management-in-infrastructure-and-built-environment/>
- Ref 17-23** Institute of Environmental Management & Assessment (IEMA) (2022). Environmental Impact Assessment Guide to Assessing Greenhouse Gas Emissions and Evaluating their Significance. Available at: <https://www.iema.net/resources/ghg-emissions-assessment-guide>

- Ref 17-24** DESNZ UK Carbon Budgets (2021). Available at: <https://www.gov.uk/guidance/carbon-budgets>
- Ref 17-25** Kendon, M et al. (2022). State of the UK Climate 2021. Available at https://www.researchgate.net/publication/362294444_State_of_the_UK_Climate_2021?cfchl tk=NuzEPO6D_6oIG2WymIr69YC5kLJE1Lp7lO6taPzj_t0-1717413021-0.0.1.1-4308
- Ref 17-26** UK Carbon Budget Delivery Plan (2023). Available at: <https://www.gov.uk/government/publications/carbon-budget-delivery-plan>
- Ref 17-27** Carbon Capture, Usage and Storage Policy Paper: a vision to establish a competitive market (2023). Available at: <https://www.gov.uk/government/publications/carbon-capture-usage-and-storage-a-vision-to-establish-a-competitive-market/carbon-capture-usage-and-storage-a-vision-to-establish-a-competitive-market>
- Ref 17-28** UKCP18 Guidance: Representative Concentration Pathways. Available at: <https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/research/ukcp/ukcp18-guidance---representative-concentration-pathways.pdf>
- Ref 17-29** DEZNZ and BEIS (2021). Industrial Decarbonisation Strategy. Available at: <https://www.gov.uk/government/publications/industrial-decarbonisation-strategy>
- Ref 17-30** Department for Business and Trade (2025). Modern Industrial Strategy. Available at: <https://www.gov.uk/government/collections/the-uks-modern-industrial-strategy-2025>

18. Major Accidents and Disasters

18.1 Introduction

- 18.1.1 This chapter considers the potential risk of a major accident or disaster (MA&Ds) causing a significant environmental effect that may arise relating to the construction, operation or maintenance of the Proposed Development.
- 18.1.2 The topic was introduced into UK EIA Regulations as a result of EU Directive 2014-52-EU (the EIA Directive relating to major accidents and disasters). It covers the assessment of potentially significant adverse effects of a development on the environment deriving from its vulnerability to risks of major accidents and/or disasters.
- 18.1.3 This assessment for major accidents and disasters is guided by a Primer published by ISEP (formerly IEMA) (Ref 18-1). The Primer defines the following:
- **Major accident:** events that threaten immediate or delayed serious environmental effects to human health, welfare and/or the environment and require the use of resources beyond those of the Client or its appointed representatives to manage. Whilst malicious intent is not accidental, the outcome (e.g. train derailment) may be the same and therefore many mitigation measures will apply to both deliberate and accidental events;
 - **Disaster:** may be a natural hazard (e.g. earthquake) or a man-made/external hazard (e.g. act of terrorism) with the potential to cause an event or situation that meets the definition of a major accident.
- 18.1.4 Major accidents can be caused by disasters resulting from both man-made and natural hazards.
- 18.1.5 In general, major accidents and / or disasters should be considered as part of an assessment where the development has the potential to cause the loss of life, permanent injury and/or temporary or permanent destruction of an environmental receptor which cannot be restored through minor clean-up and restoration.
- 18.1.6 This chapter considers two aspects: the vulnerability of the Proposed Development to a major accident/disaster, and the potential for the Proposed Development to cause a major accident.
- 18.1.7 This chapter will:
- Identify the major accidents and disasters topics and events that would be scoped into the environmental assessment and thus included within the Environmental Statement (ES);
 - Identify those major accidents and disasters topics and events scoped out of further assessment, with a justification provided; and
 - Define the approach and methodology for identifying potential major accidents and disasters events and their assessment, in the context of the Proposed Development.
- 18.1.8 There may be interrelationships between major accidents and disasters and other disciplines. Therefore, consideration should also be given to the following technical chapters:
- Chapter 5: Air Quality;
 - Chapter 11: Water Environment;
 - Chapter 13: Geology and Ground Conditions;

- Chapter 15: Human Health; and
- Chapter 17 Climate Change.

18.2 Legislation, Policy and Guidance

18.2.1 A brief overview of the policy, legislative and guidance relevant to the major accidents and disasters assessment have been reviewed and summarised in the tables below.

Table 18-1: Legislation Relevant to Major Accidents and Disasters Assessment

Legislation
Health and Safety at Work etc. Act 1974 (Ref 18-2)
Construction (Design and Management) Regulations 2015 (CDM) (Ref 18-3)
Control of Major Accident Hazards Regulations 2015 (COMAH) (Ref 18-4)
The Planning (Hazardous Substances) Regulations 2015 (Ref 18-5)
The Supply of Machinery (Safety) Regulations 2008 (Ref 18-6)
The Dangerous Substances and Explosive Atmospheres Regulations 2002 (Ref 18-7)
The Gas Safety (Management) Regulations 1996 (Ref 18-8)
The Lifting Operations and Lifting Equipment Regulations 1998 (Ref 18-9))
The Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres Regulations 2016 (Ref 18-10)
The Pipelines Safety Regulations 1996 (Ref 18-11)
The Control of Substances Hazardous to Health (COSHH) Regulations 2002 (Ref 18-12)

Table 18-2: National Planning Policy Relevant to Major Accidents and Disasters Assessment

National Planning Policy
Overarching National Policy Statement for Energy (EN-1) (Ref 18-13)
National Policy Statement for Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4) (Ref 18-14)
National Planning Policy Framework (Ref 18-15)
Associated Planning Practice Guidance (Ref 18-16)

Table 18-3: Relevant Standards and Guidance

Relevant Standards and Guidance
The International Standards Organizations ISO 311000: 2018 Risk Management – Principles and Guidelines (Ref 18-17)
Defra, 2011, ‘Guidelines for Environmental Risk Assessment and Management’ (Ref 18-18)
IEMA, 2020, ‘Major Accidents and Disasters in EIA: An IEMA Primer’ (Ref 18-1)

18.2.2 Additional guidance and data sources will be researched within the full assessment and included in the ES.

18.3 Defining the Study Area

18.3.1 The baseline relevant to major accidents and disasters primarily comprises:

- Features external to the Proposed Development that contribute a potential source of hazard to the Proposed Development itself;
- Sensitive environmental receptors at risk of significant effect; and
- Identified major accident and disaster risks which currently exist within the local area.

18.3.2 In line with regulations, the baseline environment would be established through existing sources of risk assessment or other relevant studies, rather than collecting survey data.

Information sources

18.3.3 The baseline would be further refined during the environmental impact assessment (EIA) and outlined within the ES.

Study Area

18.3.4 The Study Area for assessment of MA&Ds is not defined within regulatory guidance or standardised methodology. However, it is likely that a Study Area of 5 km from the Scoping Boundary will be utilised, based on the use of professional judgement and previous assessments of similar, comparable projects.

Receptors

18.3.5 Receptors are features of the environment which may be affected and thus are subject to assessment under Section 5 (2) of the EIA Regulations 2017 (Ref 18-19), namely biodiversity, land, soil, water, air and climate, material assets, cultural heritage and landscape. Key receptors also include human populations.

18.3.6 These have been identified through a review of base mapping and aerial photography as well as consultation with the other topics (Chapters 5-17). Table 18-5 to Table 18-12 identify the key major event receptors within the Study Area.

Accidents and Disaster Categories

18.3.7 Within the Study Area, the potential major accidents and disaster groups and categories considered are listed in Table 18-4. Major accident and disaster events are then derived from each of the categories.

18.3.8 As a general rule, Natural Hazards are only considered during the operational phase due to the relatively short durations of the construction and decommissioning phases of the Proposed Development. This excludes geophysical hazards which may be initiated by construction and decommissioning activities.

Table 18-4: Major Accidents and Disaster Groups and Categories

Groups	Categories
Natural	Geophysical Hydrological Climatological and meteorological Biological

Groups	Categories
Technological / Manmade Hazards	Industrial and urban accidents Transport accidents Pollution accidents Utility failures Engineering accidents and failures Human error/management failure Design error Sabotage/arson Terrorism Explosion (chemical, nuclear or other)

18.4 Baseline Environment

18.4.1 The baseline relevant to major accidents and disasters primarily comprises:

- Features external to the Proposed Development that contribute a potential source of hazard to the Proposed Development itself;
- Sensitive environmental receptors at risk of significant effect; and
- Identified major accident and disaster risks which currently exist within the local area.

18.4.2 In line with regulations, the baseline environment would be established through existing sources of risk assessment or other relevant studies, rather than collecting survey data.

18.4.3 The baseline conditions described for major accidents and disaster events are derived from the following desk study sources:

- Technical chapters of this Scoping Report (Chapters 5 to 15);
- National Risk Register 2025 (Ref 18-20);
- British Geological Survey 'Onshore GeoIndex' (Ref 18-21);
- The Mining Remediation Authority Interactive Map (Ref 18-22);
- Health and Safety Executive's Planning Advice Web App (Ref 18-23);
- COMAH 2015 Public Information Search (Ref 18-24);
- Aerial Photography; and
- Google street view maps covering the Scoping Boundary.

Table 18-5: Major Accidents and Disasters Baseline Environment - Breedon Capture Facility

Major Events Receptor	Type	Description
Members of the public and local communities	Human Health	There are a few hamlets and villages within the vicinity of Breedon Capture Facility including Castleton, Hope and Bradwell.
Railways	Land	The Northern Railway line extends into Hope located approximately 1.5 km from Breedon Capture Facility. The railway line also extends to the existing cement works for deliveries
Main rivers, ordinary watercourses, canals	Water	The River Wye lies within 1.5 km of Breedon Capture Facility
Designated Sites	Biodiversity	There are 2 European designated sites within 5km of Breedon Capture Facility and 13 Nationally designated sites
Protected Species	Biodiversity	Subject to survey, there are likely to be protected species within the Scoping Boundary
Heritage assets and archaeology	Cultural Heritage	There are designated and non-designated heritage assets within the 5 km Study Area for this topic

Table 18-6: Major Accidents and Disasters Baseline Environment - Tarmac Capture Facility

Major Events Receptor	Type	Description
Members of the public and local communities	Human Health	There are multiple hamlets and villages within the vicinity of Tarmac Capture Facility including Hargatewall, Upper End and Wormhill, as well as larger residential towns such as Buxton
Railways	Land	The Northern Railway line extends into Buxton located approximately 3.5 km from Tarmac Capture Facility
Main rivers, ordinary watercourses, canals	Water	The River Wye lies within 1.5 km of Tarmac Capture Facility
Designated Sites	Biodiversity	There is 1 European designated site within 5 km of Tarmac Capture Facility and 9 Nationally designated sites
Protected Species	Biodiversity	Subject to survey, there are likely to be protected species within the Scoping Boundary

Major Events Receptor	Type	Description
Heritage assets and archaeology	Cultural Heritage	There are designated and non-designated heritage assets within the 5 km Study Area for this topic

Table 18-7: Major Accidents and Disasters Baseline Environment - Buxton Lime Capture Facility

Major Events Receptor	Type	Description
Members of the public and local communities	Human Health	There are multiple hamlets and villages within the vicinity of Buxton Lime Capture Facility including East Sterndale, Sterndale Moor and Harpur Hill
Railways	Land	Railway lines from Buxton extend to/from existing cement works for deliveries
Main rivers, ordinary watercourses, canals	Water	The River Wye lies within 1.5 km of Buxton Lime Capture Facility
Designated Sites	Biodiversity	There is 1 European designated site within 5 km of Buxton Lime Capture Facility and 8 Nationally designated sites
Protected Species	Biodiversity	Subject to survey, there are likely to be protected species within the Scoping Boundary
Heritage assets and archaeology	Cultural Heritage	There are designated and non-designated heritage assets within the 5 km Study Area for this topic

Table 18-8: Major Accidents and Disasters Baseline Environment - Holcim Capture Facility

Major Events Receptor	Type	Description
Members of the public and local communities	Human Health	There are a few hamlets and villages within the vicinity of Holcim Capture Facility including Cauldon and Waterhouses as well as some farmhouses within the vicinity
Railways	Land	Railway lines from Buxton extend to/from existing cement works for deliveries
Main rivers, ordinary watercourses, canals	Water	There are no main rivers within 5 km of the Holcim Capture Facility
Designated Sites	Biodiversity	There is 1 European designated site within 5 km of Holcim Capture Facility and 10 Nationally designated sites

Major Events Receptor	Type	Description
Protected Species	Biodiversity	Subject to survey, there are likely to be protected species within the Scoping Boundary
Heritage assets and archaeology	Cultural Heritage	There are designated and non-designated heritage assets within the 5 km Study Area for this topic

Table 18-9: Major Accidents and Disasters Baseline Environment - Peak Cluster Pipeline East

Major Events Receptor	Type	Description
Members of the public and local communities	Human Health	The Pipeline route passes through a number of towns and villages, including Buxton, Macclesfield, Congleton, Leek and Waterhouses
	Land	There are 3 COMAH sites within 5 km of this section of the pipeline, located within Stockport, Macclesfield and Leek
Railways	Land	The Pipeline route passes through multiple railway lines including the Northern, Avanti West Coast, Cross Country and Transport for Wales
Main rivers, ordinary watercourses, canals	Water	The Pipeline route passes through multiple water features
Designated Sites	Biodiversity	There are 3 European designated sites and 56 Nationally designated sites within 5 km of this section of the pipeline
Protected Species	Biodiversity	Subject to survey, there are likely to be protected species within the Scoping Boundary.
Heritage assets and archaeology	Cultural Heritage	There are designated and non-designated heritage assets within the 5 km Study Area for this topic

Table 18-10: Major Accidents and Disasters Baseline Environment - Peak Cluster Pipeline Central

Major Events Receptor	Type	Description
Members of the public and local communities	Human Health	The Pipeline route passes through a number of towns and villages, including Congleton, Middlewich, Crewe and Tarporley.
	Land	There are 8 COMAH sites within 5km of this section of the pipeline, located within Middlewich, Crewe, Sandbach, Alsager and Stoke on Trent.
Railways	Land	The Pipeline route passes through multiple railway lines including the Northern, Avanti West Coast, Cross Country, Transport for Wales, Caledonian Sleeper and London Northwestern.
Main rivers, ordinary watercourses, canals	Water	The Pipeline route passes through multiple water features
Designated Sites	Biodiversity	There is 1 European designated site and 13 Nationally designated sites within 5 km of this section of the pipeline
Protected Species	Biodiversity	Subject to survey, there are likely to be protected species within the Scoping Boundary.
Heritage assets and archaeology	Cultural Heritage	There are designated and non-designated heritage assets within the 5 km Study Area for this topic.

Table 18-11: Major Accidents and Disasters Baseline Environment - Peak Cluster Pipeline West

Major Events Receptor	Type	Description
Members of the public and local communities	Human Health	The Pipeline route passes through a number of towns and villages, including: Tarporley and Chester as well as residential areas along the Wirral peninsula.
	Land	There are 15 COMAH sites within 5km of this section of the pipeline, located within Chester, Deeside, Ellesmere Port and Wirral.
Railways	Land	The Pipeline route passes through multiple railway lines including the Northern, Avanti West Coast, Transport for Wales and Merseyrail.
River Mersey and the River Dee	Water	Are within the Scoping Boundary of this section of pipeline and each pose a risk of tidal flooding.

Major Events Receptor	Type	Description
Main rivers, ordinary watercourses, canals	Water	The Pipeline route passes through multiple water features
Designated Sites	Biodiversity	There are 5 European designated sites and 11 Nationally designated sites within 5 km of this section of the pipeline
Protected Species	Biodiversity	Subject to survey, there are likely to be protected species within the Scoping Boundary.
Heritage assets and archaeology	Cultural Heritage	There are designated and non-designated heritage assets within the 5 km Study Area for this topic

Table 18-12: Major Accidents and Disasters Baseline Environment – Coastal AGI to MLWS Pipeline(s)

Major Events Receptor	Type	Description
Members of the public and local communities	Human Health	The pipeline(s) from Coastal AGI are located within the Wirral peninsula between the communities of Meols and Moreton, and to the 2 km north-west of Greasby.
Railways	Land	The pipeline(s) from Coastal AGI lies within the vicinity of the Transport for Wales and Merseyrail railway lines.
River Mersey, River Dee and the Irish Sea	Water	Are within the Scoping Boundary of this section of pipeline(s) and each pose a risk of tidal flooding.
Main rivers, ordinary watercourses, canals	Water	The pipeline(s) from Coastal AGI passes through multiple water features.
Designated Sites	Biodiversity	There are 3 European designated sites and 4 Nationally designated sites within 5 km of this section of the pipeline.
Protected Species	Biodiversity	Subject to survey, there are likely to be protected species within the Scoping Boundary.
Heritage assets and archaeology	Cultural Heritage	There are designated and non-designated heritage assets within the 5 km Study Area for this topic.

18.5 Planned Surveys

- 18.5.1 No primary baseline data surveys are planned to support the major accidents and disasters assessment.

18.6 Identification of Potential Effects

- 18.6.1 For the major accidents and disasters event types which have been scoped in for further assessment in the ES, the assessment would be conducted using a staged approach as outlined here:
- Identifying potential risk events related to the scoped in major event types (source /pathways and receptors);
 - Screening these risk events, e.g. to remove unrealistic worst-case scenarios;
 - Defining the reasonable worst consequence if the event did occur;
 - Identifying any cross-disciplinary impacts;
 - Identifying any possible prevention, minimisation and / or mitigation measures;
 - Assessing the likelihood; and then
 - Determining whether the risk has been mitigated to as low as reasonably practicable (ALARP) and identification of any residual risks and their significance.
- 18.6.2 The ES would include a detailed methodology for the assessment of all major accidents and disasters considered, based on the guiding principles outlined above. Any limitations of the assessment of major accidents and disasters would also be clearly presented.

18.7 Scope and Methodology

- 18.7.1 An initial scoping exercise has been undertaken to identify and review all accidents or disasters that could be relevant to the Proposed Development. This initial list was drawn from a number of sources, including the National Risk Register 2025 (Ref 18-20). This initial scoping exercise shows the potential vulnerability of the Proposed Development to the risk of a major accident and/or disaster associated with a variety of different events during each phase of the Proposed Development and is presented in Table 18-13 and Table 18-14. This table also provides further clarity on the topics and events which have been scoped into the EIA, and those which have been scoped out, with suitable justification provided.
- 18.7.2 This initial scoping review included consideration of the following key factors when it came to considering which events are of relevance to the Proposed Development:
- Events that could not realistically occur, due to the nature of the Proposed Development or its location in the UK;
 - Events that could realistically occur, but for which the Proposed Development, and associated receptors, are either no more vulnerable than any other project or would not have an impact should the event occur; and
 - Events that could occur, and to which the Proposed Development could be vulnerable, or which the Proposed Development itself has a particular capacity to exacerbate.

- 18.7.3 In general events falling into this last category would be considered for further assessment in the ES.

Methodology

- 18.7.4 For the major accidents and disasters event types which have been scoped in for further assessment in the ES, the assessment would be conducted using a staged approach as outlined here:
- Identifying potential risk events related to the scoped in major event types (source / pathways and receptors);
 - Screening these risk events, e.g. to remove unrealistic worst cases ;
 - Defining the reasonable worst consequence if the event did occur;
 - Identifying any cross-disciplinary impacts;
 - Identifying any possible prevention, minimisation and / or mitigation measures;
 - Assessing the likelihood; and then
 - Determining whether the risk has been mitigated to as low as reasonably practicable (ALARP) and identification of any residual risks and their significance.
- 18.7.5 The ES would include a detailed methodology for the assessment of all major accidents and disasters considered, based on the guiding principles outlined above. Any limitations of the assessment of major accidents and disasters would also be clearly presented.

Consultation

- 18.7.6 No pre-scoping engagement has been undertaken in preparing this scoping chapter and it is proposed that no further engagement will be undertaken unless there is a future requirement.

Assumptions and limitations

- 18.7.7 Major accidents and/or disasters associated with construction, commissioning, operation and maintenance activities that fall within the scope for health and safety legislation, and Construction Design and Management (CDM) regulations are not considered.

Table 18-13: Major Accidents and Disasters Scope and Methodology - Capture Facilities

MA&D- Capture Facilities				
Scope Scoped in ✓, scoped out ✗	Construction (C), Operation (O), Decommissioning (D)			Rationale
	C	O	D	
Natural Hazards - Geophysical				
Earthquakes	✗	✗	✗	Earthquakes in the UK are unlikely to be powerful enough to inflict severe damage.
Volcanic Activity	✗	✗	✗	The reasonable worst-case scenario is based on an ash-rich volcanic eruption into UK airspace, which is highly unlikely to have any significant impact on the Proposed Development.
Landslides	✓	✓	✓	The National Landslide Database shows there have been multiple landslides recorded within the Scoping Boundary of the Proposed Development, as such landslides will be considered further within the ES to ensure that these are fully evaluated.
Sinkholes	✓	✗	✗	Some sinkholes result from the removal of soluble rocks, such as limestone which forms part of the underlying bedrock. This can be triggered by construction works and will be considered further in the ES.
Tsunamis	✗	✗	✗	The Capture Facilities are not located in a tsunami risk zone.
Natural Hazards - Hydrology				
Tidal Flooding	✗	✗	✗	The Capture Facilities are not located in a flood risk zone.
Fluvial Flooding	✗	✗	✗	The Capture Facilities are not located in a flood risk zone.

MA&D- Capture Facilities				
Scope Scoped in ✓, scoped out ✗	Construction (C), Operation (O), Decommissioning (D)			Rationale
	C	O	D	
Pluvial Flooding	✗	✗	✗	Surface water flooding is likely to be associated with localised depressions where water will pond during or after prolonged rainfall events. This is not expected to lead to any increased risk of a major accident or disaster.
Groundwater Flooding	✗	✗	✗	There is a risk of groundwater flooding during excavations during construction phase, this is not expected to lead to any increased risk of a major accident or disaster.
Avalanches	✗	✗	✗	Avalanches are not considered relevant given the location of the Proposed Development.
Natural Hazards – Climatological and Meteorological				
Cyclones, hurricanes, typhoons, storms and gales	✗	✗	✗	Capture Facilities will be designed in line with UK standards which take into account environmental conditions including exposure to UK weather conditions.
Thunderstorms	✗	✓	✗	This type of event could result in lightning strikes to elevated structures. Lightning strikes will be considered further within the ES to ensure that these are fully evaluated.
Wave Surges	✗	✗	✗	The Capture Facilities are not located in a flood risk zone.
Extreme Temperatures: Heatwaves, Low (sub-zero) temperatures and heavy snow	✗	✗	✗	The risk is not significantly different to other similar infrastructure in the locality.
Droughts	✗	✗	✗	The Proposed Development is not expected to be vulnerable to drought conditions, as there is a low risk of interruptions to the supplies of water in this location.

MA&D- Capture Facilities				
Scope Scoped in ✓, scoped out ✗	Construction (C), Operation (O), Decommissioning (D)			Rationale
	C	O	D	
Severe Space Weather: Solar Flares Severe Space Weather: Solar Energetic Particles Severe Space Weather: Coronal Mass Ejections (CMEs)	✗	✗	✗	The Proposed Development is no more vulnerable than other similar infrastructure in the locality.
Wildfires: Forest fire, bush/brush, pasture	✗	✗	✗	The Capture Facilities are not located in wooded or highly vegetated areas.
Fog	✗	✗	✗	Should fog become an issue during the construction phase (for vehicle movements or site activity) due to visibility, safety measures will be put in place. It is not expected that fog would increase the risk of activities during typical operations.
Natural Hazards Biological				
Disease epidemics Animal diseases	✗	✗	✗	The construction and operation of the Proposed Development would not give rise to any disease epidemics.
Plants	✗	✗	✗	Standard control measures would be implemented by the appointed contractor during construction to handle and dispose of any diseased, invasive plants to prevent their spread.

MA&D- Capture Facilities				
Scope Scoped in ✓, scoped out ✗	Construction (C), Operation (O), Decommissioning (D)			Rationale
	C	O	D	
Technological or Manmade Hazards - Societal				
Extensive public demonstrations Widespread damage to societies and economies The need for largescale multi-faceted humanitarian assistance The need for largescale multi-faceted humanitarian assistance The hinderance or prevention of humanitarian assistance by political and military constraints Significant security risks for humanitarian relief workers in some areas	✗	✗	✗	The UK is considered to be a politically stable country, and the Proposed Development is not considered particularly controversial.
Famine	✗	✗	✗	Famine is not relevant to the use of the Project.

MA&D- Capture Facilities				
Scope Scoped in ✓, scoped out ✗	Construction (C), Operation (O), Decommissioning (D)			Rationale
	C	O	D	
Displaced Populations	✗	✗	✗	There will be no displacement of populations as part of the Proposed Development.
Technological or Manmade Hazards – Industrial and Urban Hazards				
Major Accidents Hazards – Chemical Sites	✗	✗	✗	There are no industrial sites regulated under the COMAH regulations within 5km of the Capture Facilities
Major Accidents Hazards – Pipelines	✗	✗	✗	Consultation would commence with the Major Accident Hazard (MAH) pipeline owners and crossing design would be such that physical damage does not occur.
Nuclear	✗	✗	✗	The likelihood of releases of radiological material in the UK is extremely low.
Fuel Storage	✗	✗	✗	Consultation would commence with any fuel storage site owners (if present within the study area), and the Proposed Development would be designed to ensure that physical damage does not occur.
Dam Breaches	✗	✗	✗	The Capture Facilities are not located in areas at risk of reservoir flooding.
Mines and storage caverns	✗	✗	✗	The Capture Facilities are not within a Coal Mining Reporting Area.

MA&D- Capture Facilities				
Scope Scoped in ✓, scoped out ✗	Construction (C), Operation (O), Decommissioning (D)			Rationale
	C	O	D	
Fires	✓	✓	✓	Fires could be initiated by construction and site activities and may be exacerbated dependent on the materials stored on site for operation of the Capture Facilities, as such fires will be considered further within the ES to ensure that this is fully evaluated.
Technological or Manmade Hazards – Transport accidents				
Road	✗	✗	✗	Appropriate mitigation for traffic and transport effects would be described within a draft CEMP which would be submitted with the ES.
Rail	✗	✗	✗	Appropriate mitigation for working near railways would be described within a draft CEMP which would be submitted with the ES.
Waterways	✗	✗	✗	Waterway crossings are not relevant to the construction of the Capture Facilities.
Aviation	✓	✓	✗	The Calton Moor Airfield located 2.5 km East of the Caudon Carbon Capture Facility. There will be close liaison and agreement with the associated airfield operators before works commence near the airfields. Aviation will be screened in for further assessment in the ES.

MA&D- Capture Facilities				
Scope Scoped in ✓, scoped out ✖	Construction (C), Operation (O), Decommissioning (D)			Rationale
	C	O	D	
Technological or Manmade Hazards – Pollution accidents				
Air	✖	✓	✖	If there was a significant loss of containment event it may result in a large-scale release of CO ₂ to the environment, which could potentially cause a significant adverse impact on local air quality and human health. As such, this will be considered further within the ES to ensure that this is fully evaluated.
Land Water	✖	✓	✖	There may be a risk of leaks and spillages of hazardous materials associated with the Capture Facilities activities dependent on the technology used, which will be reviewed as the design progresses. This will be considered further within the ES to ensure that this is fully evaluated.
Electricity	✖	✖	✖	Any work required near electric overhead power lines would be adequately controlled and consulted on with the operator, and appropriate site-specific risk assessments completed.
Gas	✖	✖	✖	Consultation would commence with the gas transmission owners and crossing design would be such that physical damage does not occur.
Water Supply	✖	✖	✖	Consultation would commence with the water supply owners and crossing design would be such that physical damage does not occur.
Sewage System	✖	✖	✖	No use of the sewage system is associated with the Proposed Development.
Technological or Manmade Hazards – Malicious Attacks				
Unexploded ordnance	✖	✖	✖	The 5 km area around the Capture Facilities are all relatively low risk areas.

MA&D- Capture Facilities				
Scope Scoped in ✓, scoped out ✗	Construction (C), Operation (O), Decommissioning (D)			Rationale
	C	O	D	
Chemical / Biological / Radiological / Nuclear Transport Systems Crowded places	✗	✗	✗	The Proposed Development is unlikely to be a target for such an event. The Proposed Development is unlikely to be a target for this type of event due to the low number of exposed targets.
Technological or Manmade Hazards – Engineering accidents and failures				
Cyber	✗	✓	✗	The Applicant is accountable to the Secretary of State for Energy and Net Zero for ensuring the resilience of their assets (i.e. cement, lime and Capture Facilities) to national security risks, including from terrorism, cyber-attack, natural hazards and other risks. Consequently, this will be assessed further within the ES.
Infrastructure	✓	✓	✓	The Proposed Development will be developed following the most up to date regulations and standards in place at the time of its development. These requirements have been developed to reduce the risk of accidents of failures and draw upon experiences from around the world. This will be investigated further within the ES.
Bridge failure	✗	✗	✗	Bridge works are not proposed as part of the Proposed Development.
Flood defence failure	✗	✗	✗	The Capture Facilities are not located in areas at risk of flooding from any source.

MA&D- Capture Facilities				
Scope Scoped in ✓, scoped out ✗	Construction (C), Operation (O), Decommissioning (D)			Rationale
	C	O	D	
Mast and tower collapse	✗	✗	✗	Any work required near electric overhead power lines would be adequately controlled and consulted on with the operator, and appropriate site-specific risk assessments.
Property or bridge demolition accidents	✓	✗	✗	Construction of the Capture Facilities would involve demolition for site clearance. Control measures would be put in place when carrying out these activities and would form part of the Outline CEMP. This will be investigated further within the ES. No property or bridges will be demolished as part of decommissioning.
Tunnel failure/fire	✗	✗	✗	There are no tunnel structures proposed as part of the Proposed Development.

Table 18-14: Major Accidents and Disasters Scope and Methodology – Peak Cluster Pipeline and Pipeline(s) from Coastal AGI to MLWS

MADS – Peak Cluster Pipeline and Coastal AGI to MLWS Pipeline				
Scope Scoped in ✓, scoped out ✗	Construction(C), Operation (O), Decommissioning (D)			Rationale
	C	O	D	
Natural Hazards - Geophysical				
Earthquakes	✗	✗	✗	Earthquakes in the UK are unlikely to be powerful enough to inflict severe damage.
Volcanic Activity	✗	✗	✗	The reasonable worst-case scenario is based on an ash-rich volcanic eruption into UK airspace, which is highly unlikely to have any significant impact on the Project.
Landslides	✓	✓	✗	The National Landslide Database shows there have been multiple landslides recorded within the Scoping Boundary of the Proposed Development, as such landslides will be considered further within the ES to ensure that these are fully evaluated.
Sinkholes	✓	✗	✗	Some sinkholes result from the removal of soluble rocks, such as limestone which forms part of the underlying bedrock. This can be triggered by construction works and will be considered further in the ES.
Tsunamis	✗	✗	✗	The Proposed Development is not located in a tsunami risk zone.
Natural Hazards - Hydrology				
Tidal Flooding	✗	✓	✗	Multiple sections of the pipeline and AGIs within the Wirral peninsula are in areas at risk of tidal flooding. The ES will include further work to confirm the risk of major accidents related to tidal flooding.
Fluvial Flooding	✗	✓	✗	Multiple sections of the pipeline and the AGI cross Flood Zone 2 and 3 areas. The ES will include further work to confirm the risk of major accidents related to fluvial flooding.

MADS – Peak Cluster Pipeline and Coastal AGI to MLWS Pipeline				
Scope Scoped in ✓, scoped out ✗	Construction(C), Operation (O), Decommissioning (D)			Rationale
	C	O	D	
Pluvial Flooding	✗	✗	✗	Surface water flooding is likely to be associated with localised depressions where water will pond during or after prolonged rainfall events. This is not expected to lead to any increased risk of a major accident or disaster.
Groundwater Flooding	✗	✗	✗	There is a risk of groundwater flooding during excavations during construction phase, this is not expected to lead to any increased risk of a major accident or disaster.
Avalanches	✗	✗	✗	Avalanches are not considered relevant given the location of the Proposed Development.
Natural Hazards – Climatological and Meteorological				
Cyclones, hurricanes, typhoons, storms and gales	✗	✗	✗	AGIs will be designed in line with UK standards which take into account environmental conditions including exposure to UK weather conditions.
Thunderstorms	✗	✗	✗	This type of event could result in lightning strikes to temporarily elevated structures during construction. However, the risk is no different to other construction projects in the locality.
Wave Surges	✗	✓	✗	Part of the pipeline and some AGIs are likely to be located in an area at risk of tidal flooding. Wave surges are not considered to be a major consideration related to accidents, but the ES will include further work to confirm this.

MADS – Peak Cluster Pipeline and Coastal AGI to MLWS Pipeline				
Scope Scoped in ✓, scoped out ✗	Construction(C), Operation (O), Decommissioning (D)			Rationale
	C	O	D	
Extreme Temperatures: Heatwaves, Low (sub-zero) temperatures and heavy snow	✗	✗	✗	The risk is not significantly different to other similar infrastructure in the locality.
Droughts	✗	✗	✗	The Proposed Development is not expected to be vulnerable to drought conditions, as there is a low risk of interruptions to the supplies of water in this location.
Severe Space Weather: Solar Flares Severe Space Weather: Solar Energetic Particles Severe Space Weather: Coronal Mass Ejections (CMEs)	✗	✗	✗	The Proposed Development is no more vulnerable than other similar infrastructure in the locality.
Wildfires: Forest fire, bush/brush, pasture	✗	✗	✗	The Pipeline does pass through some wooded and vegetated areas but should weather conditions during construction become hot and dry for a long period of time, further consideration would be given to hot work activity locations.
Fog	✗	✗	✗	Should fog become an issue during the construction phase due to visibility, standard site safety measures would be used. It is not expected that fog would increase the risk of activities during typical operations.

MADS – Peak Cluster Pipeline and Coastal AGI to MLWS Pipeline				
Scope Scoped in ✓, scoped out ✗	Construction(C), Operation (O), Decommissioning (D)			Rationale
	C	O	D	
Natural Hazards Biological				
Disease epidemics Animal diseases	✗	✗	✗	The construction and operation of the Proposed Development would not give rise to any disease epidemics.
Plants	✗	✗	✗	Standard control measures would be implemented by the appointed contractor during construction to handle and dispose of any diseased, invasive plants to prevent their spread.
Technological or Manmade Hazards - Societal				
Extensive public demonstrations Widespread damage to societies and economies The need for largescale multi-faceted humanitarian assistance The hinderance or prevention of humanitarian assistance by political and military constraints Significant security risks for humanitarian relief workers in some areas	✗	✗	✗	The UK is considered to be a politically stable country, and the Proposed Development is not considered particularly controversial.

MADS – Peak Cluster Pipeline and Coastal AGI to MLWS Pipeline				
Scope Scoped in ✓, scoped out ✗	Construction(C), Operation (O), Decommissioning (D)			Rationale
	C	O	D	
Famine	✗	✗	✗	Famine is not relevant to the use of the Proposed Development.
Displaced Populations	✗	✗	✗	There will be no displacement of populations as part of the Proposed Development.
Technological or Manmade Hazards – Industrial and Urban Hazards				
Major Accidents Hazards – Chemical Sites	✓	✓	✓	There are approximately 12 Lower tier and 15 Upper tier COMAH sites within the Study Area. The inter-relationship with the pipeline and the potential for events to occur which could lead to potential incidents will be explored further and included within the ES.
Major Accidents Hazards – Pipelines	✓	✓	✓	There are Major Accident Hazard (MAH) pipelines within the Scoping Boundary of the pipeline. The inter-relationship with our Project and the potential for events to occur which could lead to potential incidents will be explored further and included within the ES.
Nuclear	✓	✓	✓	The pipeline lies within 1.5 km of the Capenhurst Nuclear facility. Though, the likelihood of releases of radiological material in the UK is extremely low, the inter-relationship with the pipeline and the potential for events to occur which could lead to potential incidents will be explored further and included within the ES
Fuel Storage	✗	✗	✗	Consultation would commence with any fuel storage site owners (if present within the study area), and the Proposed Development would be designed to ensure that physical damage does not occur.
Dam Breaches	✗	✗	✗	The pipeline crosses multiple areas at risk of reservoir flooding. A UK dam breach is highly unlikely. However, if a breach occurs, the emergency services will issue a warning and may decide that evacuation is necessary.

MADS – Peak Cluster Pipeline and Coastal AGI to MLWS Pipeline				
Scope Scoped in ✓, scoped out ✗	Construction(C), Operation (O), Decommissioning (D)			Rationale
	C	O	D	
Mines and storage caverns	✓	✗	✗	The pipeline crosses multiple Coal Mining Reporting Areas. Consultation with the Coal Authority and/or asset owners as appropriate to ensure risks are appropriately identified, as such this will be screen in for further assessment in the ES
Fires	✗	✗	✗	It is unlikely for a fire to be generated during operation of the pipeline due to the nature of activities undertaken and substances stored.
Technological or Manmade Hazards – Transport accidents				
Road	✗	✗	✗	Appropriate mitigation for traffic and transport effects would be described within a draft CEMP which would be submitted with the ES.
Rail	✗	✗	✗	Appropriate mitigation for working near railways would be described within a draft CEMP which would be submitted with the ES.
Waterways	✓	✗	✗	There are multiple waterway crossings required for the pipeline. As such this will be screen in for further assessment in the ES.

MADS – Peak Cluster Pipeline and Coastal AGI to MLWS Pipeline

Scope Scoped in ✓, scoped out ✗	Construction(C), Operation (O), Decommissioning (D)			Rationale
	C	O	D	
Aviation	✓	✗	✗	The Ashcroft Airfield located 3.5 km West of the pipeline Scoping Boundary at its closest point. Whilst the Wallasey VOR is located 8 m away from the Scoping Boundary. There will be close liaison and agreement with the associated airfield operators before works commence near the airfields. Aviation will be screened in for further assessment in the ES.
Technological or Manmade Hazards – Pollution accidents				
Air	✗	✓	✗	If there was a significant loss of containment event it may result in a large-scale release of CO ₂ to the environment, which could potentially cause a significant adverse impact on local air quality and human health. As such, this will be considered further within the ES to ensure that this is fully evaluated.
Land	✗	✗	✗	During the construction phase there may be an increase in the risk of leaks and spillages of hazardous materials associated with the construction activities. This risk would be controlled through standard control measures which would form commitments within the draft CEMP.
Water	✗	✗	✗	During construction of the pipeline there is a risk of contaminating watercourse that the pipeline passes through as well as groundwater, however mitigation measures would be incorporated into the draft CEMP.
Electricity	✗	✗	✗	Any work required near electric overhead or underground power lines would be adequately controlled and consulted on with the operator, and appropriate site-specific risk assessments completed.

MADS – Peak Cluster Pipeline and Coastal AGI to MLWS Pipeline				
Scope Scoped in ✓, scoped out ✗	Construction(C), Operation (O), Decommissioning (D)			Rationale
	C	O	D	
Gas	✓	✗	✗	Underground gas transmission pipelines are present in the Scoping Boundary. Detailed information on these would be sought once pipeline routing is more developed, and consequently this has been scoped in for further assessment.
Water Supply	✗	✗	✗	Consultation would commence with the water supply owners and crossing design would be such that physical damage does not occur.
Sewage System	✗	✗	✗	No use of the sewage system is associated with the Proposed Development.
Technological or Manmade Hazards – Malicious Attacks				
Unexploded ordnance	✓	✗	✗	Part of the Scoping Boundary contains a UXO high risk area. Measures would be undertaken during the construction phase to raise awareness of this issue to construction site staff and operatives, and to define the appropriate response strategies should any be discovered during the works. Further assessment of UXO would be included within the ES and how they can link to major incidents.
Chemical / Biological / Radiological / Nuclear Transport Systems Crowded places	✗	✗	✗	The Proposed Development is unlikely to be a target for such an event. The Proposed Development is unlikely to be a target for this type of event due to the low number of exposed targets.
Technological or Manmade Hazards – Engineering accidents and failures				
Cyber	✗	✓	✗	The Applicant is accountable to the Secretary of State (SoS) for Energy and Net Zero for ensuring the resilience of their assets (i.e. cement, lime and CCP facilities) to national security risks, including from terrorism, cyber-attack, natural hazards and other risks. Consequently, this will be assessed further within the ES.

MADS – Peak Cluster Pipeline and Coastal AGI to MLWS Pipeline				
Scope Scoped in ✓, scoped out ✗	Construction(C), Operation (O), Decommissioning (D)			Rationale
	C	O	D	
Infrastructure	✓	✓	✓	The Proposed Development will be developed following the most up to date regulations and standards in place at the time of its development. These requirements have been developed to reduce the risk of accidents of failures and draw upon experiences from around the world. This will be investigated further within the ES.
Bridge failure	✗	✗	✗	Bridge works are not proposed as part of the Proposed Development.
Flood defence failure	✗	✗	✗	There are watercourses within the Scoping Boundary that benefit from flood defences. The design of the Proposed Development will be developed to include allowances for future climate change predicted effects on flooding. The potential risk of breach events will be considered in the ES.
Mast and tower collapse	✗	✗	✗	Any work required near electric overhead power lines would be adequately controlled and consulted on with the operator, and appropriate site-specific risk assessments.
Property or bridge demolition accidents	✓	✗	✗	Construction may involve demolition for site clearance. Control measures would be put in place when carrying out these activities and would form part of the Outline CEMP. This will be investigated further within the ES.

MADS – Peak Cluster Pipeline and Coastal AGI to MLWS Pipeline				
Scope Scoped in ✓, scoped out ✗	Construction(C), Operation (O), Decommissioning (D)			Rationale
	C	O	D	
Tunnel failure/fire	✗	✗	✗	There are no tunnel structures proposed as part of the Proposed Development. The trenchless technique to be used at the landfall location is of insufficient size to prove a risk for tunnel fire or failure.
Vessel Collision	✓	✓	✗	Construction and maintenance may involve some sea going vessels with the potential for anchor drag/ship collision. As the pipeline will be left in place it is unlikely that vessels will be required for decommissioning.

18.8 Summary

- 18.8.1 This chapter has identified the major accidents and disaster topics and events that would be scoped into the EIA and presented within the ES. The topics and events to be scoped out have also been identified, and justification provided. These are summarised in Table 18-13 and Table 18-14.

18.9 References

- Ref 18-1** IEMA, Major Accidents and Disasters in EIA: A Primer (2020). Available at: <https://www.iema.net/resources/blog/2020/09/23/iema-major-accidents-and-disasters-in-eia-primer>
- Ref 18-2** H.M. Government (1974). Health and Safety at Work etc. Act 1974. Available at: <https://www.legislation.gov.uk/ukpga/1974/37/contents>
- Ref 18-3** H.M. Government (2015). Construction (Design and Management) Regulations 2015 (CDM). Available at: <https://www.legislation.gov.uk/uksi/2015/51/contents/made>
- Ref 18-4** H.M. Government (2015). Control of Major Accident Hazards Regulations 2015 (COMAH). Available at: <https://www.legislation.gov.uk/uksi/2015/483/contents>
- Ref 18-5** H.M. Government (2015). The Planning (Hazardous Substances) Regulations 2015. Available at: <https://www.legislation.gov.uk/uksi/2015/627/contents>
- Ref 18-6** H.M. Government (2008). The Supply of Machinery (Safety) Regulations 2008. Available at: <https://www.legislation.gov.uk/uksi/2008/1597/contents>
- Ref 18-7** H.M. Government (2002). The Dangerous Substances and Explosive Atmospheres Regulations 2002. Available at: <https://www.legislation.gov.uk/uksi/2002/2776/contents>
- Ref 18-8** H.M. Government (1996). Gas Safety (Management) Regulations 1996. Available at: <https://www.legislation.gov.uk/uksi/1996/551/contents>
- Ref 18-9** H.M. Government (1998). The Lifting Operations and Lifting Equipment Regulations 1998. Available at: <https://www.legislation.gov.uk/uksi/1998/2307/contents>
- Ref 18-10** H.M. Government (2016). The Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres Regulations 2016. Available at: <https://www.legislation.gov.uk/uksi/2016/1107/contents>
- Ref 18-11** H.M. Government (1996). The Pipelines Safety Regulations 1996. Available at: <https://www.legislation.gov.uk/uksi/1996/825/contents>
- Ref 18-12** H.M. Government (2022). The Control of Substances Hazardous to Health Regulations 2002. Available at: <https://www.legislation.gov.uk/uksi/2002/2677/contents>
- Ref 18-13** DESNZ, Overarching National Policy Statement for Energy (EN-1), 2023. Available at: https://assets.publishing.service.gov.uk/media/64252f3b60a35e00120cb158/NPS_EN-1.pdf
- Ref 18-14** DESNZ, National Policy Statement for Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4), 2023. Available at: <https://www.gov.uk/government/publications/national-policy-statement-for-natural-gas->

[supply-infrastructure-and-gas-and-oil-pipelines-en-4/national-policy-statement-for-natural-gas-supply-infrastructure-and-gas-and-oil-pipelines-en-4](#)

- Ref 18-15** MHCLG, National Planning Policy Framework, 2024. Available at: https://assets.publishing.service.gov.uk/media/67aafe8f3b41f783cca46251/NPPF_December_2024.pdf
- Ref 18-16** MHCLG, Planning Practice Guidance, 2024. Available at: <https://www.gov.uk/government/collections/planning-practice-guidance>
- Ref 18-17** The International Standards Organizations, ISO 31000: 2018 Risk Management – Principles and Guidelines
- Ref 18-18** Defra, ‘Guidelines for Environmental Risk Assessment and Management’, 2011. Available at: <https://www.gov.uk/government/publications/guidelines-for-environmental-risk-assessment-and-management-green-leaves-iii>
- Ref 18-19** H.M. Government, Infrastructure Planning (Environmental Impact Assessment) (EIA) Regulations 2017. Available at: <https://www.legislation.gov.uk/uksi/2017/572/contents>
- Ref 18-20** H.M. Government, National Risk Register 2025. Available at: https://assets.publishing.service.gov.uk/media/67b5f85732b2aab18314bbe4/National_Risk_Register_2025.pdf
- Ref 18-21** British Geological Survey, ‘Onshore GeoIndex’, 2025. Available at: https://mapapps2.bgs.ac.uk/geoindex/home.html?_ga=2.252562249.172458469.1761299694-1181069592.1761299694
- Ref 18-22** Mining Remediation Authority, Interactive Map, 2025. Available at: <https://datamine-cauk.hub.arcgis.com/>
- Ref 18-23** HSE, Planning Advice Web App, 2025. Available at: <https://www.hse.gov.uk/landuseplanning/planning-advice-web-app.htm>
- Ref 18-24** HSE, COMAH 2015 Public Information Search, 2025. Available at: <https://notifications.hse.gov.uk/COMAH2015/Search.aspx>

19. Cumulative Effects

19.1 Introduction

- 19.1.1 This chapter of the Scoping Report provides a summary of the proposed assessment of cumulative effects arising from the Proposed Development. The requirement for the consideration of cumulative effects is set out in Schedule 4, paragraph 5(e) of the EIA Regulations (Ref 19-1). A range of public sector and industry-led guidance is available on the approach to assessing cumulative effects but at present there is no single, agreed industry standard method. As the Proposed Development is classified as an NSIP, the approach to the assessment of intra-project and inter-project effects follows the guidance set out in the Planning Inspectorate Advice on Cumulative Effects Assessment (Ref 19-2).
- 19.1.2 IEMA's report recognises two major sources of cumulative effects:
- **Intra-project effects:** These effects occur where a single receptor is affected by more than one source of effect arising from different aspects of the project. An example of an intra-project effect would be where a local resident is affected by dust, noise and traffic disruption during the construction of a scheme, with the result being a greater nuisance than each individual effect alone; and
 - **Inter-project effects:** These effects occur as a result of a number of developments, which individually might not be significant, but when considered together could create a significant cumulative effect on a shared receptor and will include developments separate from and related to the project.
- 19.1.3 The assessment will be based on the best available data from other proposed and committed developments and associated information which is currently in the public domain or has been provided to the Project Team. The assessment will assume that publicly available information is accurate; the assessment is also reliant on collaboration with a range of statutory consultees, neighbouring authorities and other developers to identify changes in information which may be pertinent to the assessment.
- 19.1.4 Where there are specific limitations associated with data, they will be highlighted as the assessment progresses.

19.2 Approach to Cumulative Assessment

- 19.2.1 In conjunction with professional judgement, the Planning Inspectorate's Advice on Cumulative Effects Assessment (Ref 19-2) will be used to inform the scope of the cumulative effects assessment, and to assist the identification and mitigation of likely significant effects.

Assessment of Intra-project effects

- 19.2.2 The assessment of intra-project effects will consider whether an individual environmental receptor or resource will likely be affected by more than one type of impact as a result of the construction and/or operation of the Proposed Development. The assessment methodology will involve the identification of impact interactions associated with the Proposed Development upon separate environmental receptors and resources, in order to understand the overall environmental effect of the Proposed Development.

- 19.2.3 Potential interactions will be identified by reviewing the topic conclusions within the environmental assessment topics identified in this Scoping Report, in order to establish where individual impacts may combine and result in likely significant effects. The significance of intra-project effects upon environmental receptors and resources will be determined using professional judgement, with input provided by those responsible for the production of the individual topic assessments.

Assessment of Inter-project effects

- 19.2.4 In accordance with the approach contained within Advice on Cumulative Effects Assessment (Ref 19-2) the approach to cumulative assessment will follow a staged approach, as summarised in Plate 19-1 and detailed below.

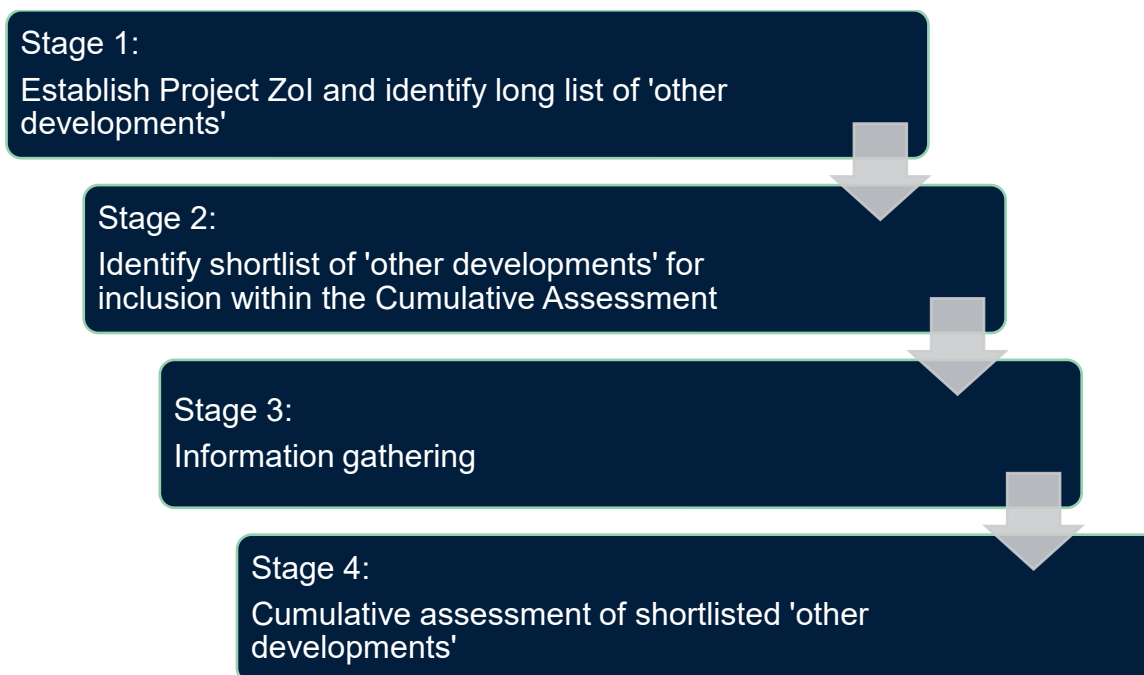


Plate 19-1: Staged approach to Cumulative Assessment

Stage 1: Establishing the long list of 'other existing development and/or approved development'

- 19.2.5 This stage involves establishing the Proposed Development's ZOI associated with the topic areas assessed, within which a long list of other planned developments and development allocations will be identified.
- 19.2.6 Development will be included on the initial long-list based on the following criteria:
- Development currently under construction;
 - Approved applications which have not yet been implemented (covering the past five years and taking account of those that received planning consent over three years ago and are still valid but have not yet been completed);
 - Submitted applications not yet determined;
 - Refused applications, subject to appeal procedures not yet determined;
 - On the National Infrastructure Planning Programme of Projects within 15km of the Scoping Boundary;

- Development identified in the relevant Development Plan (and emerging Development Plans); and
- Development identified in other plans and programmes which set the framework for future development consents/approvals, where such development is reasonably likely to come forward.

19.2.7 The provisional list will be further defined as the stage 1 work progresses and the criteria used to help filter development will be clearly identified and set out within the ES.

Stage 2: Establishing a shortlist of 'other existing development and/or approved development'

19.2.8 At Stage 2, any developments of a nature or scale without the potential to result in cumulative impacts will be excluded, following discussion with the local planning authorities and consideration of the likely zone of influence for each environmental topic. The justification for including or excluding developments from the long list will be provided in a matrix, modelled on the example given within Matrix 1 (Appendix 1) of the Planning Inspectorate's Advice on Cumulative Effects Assessment (Ref 19-2).

Stage 3: Information Gathering

19.2.9 This stage will involve reviewing the available information relating to the shortlisted development(s), in order to establish the details of their likely environmental effects.

19.2.10 Information relating to other developments will be collected from the appropriate source (which may include the local planning authorities, the Planning Inspectorate or directly from the applicant/developer) and will include, but not be limited to:

- Proposed design and location information;
- Proposed programme of demolition, construction, operation and/or decommissioning; and
- Environmental assessments that set out baseline data and effects arising from 'other development'.
- The criteria for determining the significance of any cumulative effect will be based upon:
- The duration of effect, i.e. will it be temporary or permanent;
- The extent of effect, e.g. the geographical area of an effect;
- The type of effect, e.g. whether additive or synergistic;
- The frequency of the effect;
- The 'value' and resilience of the receptor affected; and
- The likely success of mitigation.

Stage 4: Assessment

19.2.11 Those developments which meet the inclusion criteria set out in the above stages shall be incorporated into the final assessment, which will involve identifying where effects are likely to occur and assessing the significance of those effects on environmental receptors and resources, taking into account any mitigation measures.

- 19.2.12 The list of other relevant developments to be considered as part of the inter-project effects assessment will be developed in parallel with undertaking the EIA considering temporal scope, shared receptors or pathways for effects. This will include:
- Developments for which consent applications have been approved and construction has started;
 - Developments for which consent applications have been approved but construction has not yet started but which may coincide with the Proposed Development;
 - Developments for which consent applications have been submitted but have yet to be determined but which may coincide with the Proposed Development; and
 - Developments which are identified in relevant local plans or other relevant plans and programmes and which could reasonably be expected to come forward in a similar timescale to the Proposed Development.
- 19.2.13 This will be documented in a matrix, in line with Matrix 2 (Appendix 2) of the Planning Inspectorate's Advice Note on Cumulative Effects Assessment (Ref 19-2) which includes the following:
- A brief description of the other development;
 - An assessment of the cumulative effect with the other development;
 - Proposed mitigation applicable to the other development including any apportionment; and
 - The likely residual cumulative effect.

19.3 Initial Screening of Other Development Projects and Allocations (Stage 1)

- 19.3.1 As part of the scoping exercise, a preliminary review has been undertaken to identify other development projects and development plan allocations that may require consideration within the assessment of cumulative effects.
- 19.3.2 An initial review of the National Infrastructure Planning website (Ref 19-3) and planning portals for Peak District National Park Authority, High Peak Council, Staffordshire Moorlands Council; Derbyshire Dales; Cheshire East Council, Cheshire West and Chester Council, Wirral Council, Staffordshire County Council, Derbyshire County Council has identified an initial list of potential other developments that may be considered as part of the cumulative assessment for the Proposed Development.
- 19.3.3 These other developments will be identified as they are of such a nature and proximity to the Scoping Boundary to have the potential to generate inter-project effects.
- 19.3.4 The other developments have been identified through an initial ZoI set at a distance of 200 m around the Scoping Boundary, and on the National Infrastructure Planning Programme of Projects within 15 km of the Scoping Boundary. The search has been completed through the use of LandStack (Ref 19-4), and does not include all planning permissions, for example, if an application is for a change of use or extension to a residential property and searches back five years. The search is accurate as up to 27 October 2025.

- 19.3.5 A further scoping exercise will be undertaken to further filter out the development proposals unlikely to be significant in terms of their nature and scale to the extent to cause inter-project effects.
- 19.3.6 An overview of these other developments and their potential relationship with the Proposed Development is included in Appendix I and shown on Figure 19-1. This list will be fully established as part of completion of Stage 1 and Stage 2 of the Inter-project assessment and as the draft Order Limits of the Proposed Development is established. The Cumulative Assessment for the Proposed Development would be presented within a separate chapter of ES Volume IX.

19.4 Interaction with Wider Scheme

- 19.4.1 As outlined in Chapter 3, the Proposed Development comprises the onshore elements of the full chain carbon capture, transport and storage system as far as MLWS. The offshore elements of the Transport and Storage Infrastructure, beyond MLWS, are being consented separately by Spirit Energy. Additionally, any new electrical connections and power generation required for the Proposed Development will be identified. Details of the consents required will be presented in the ES.
- 19.4.2 To ensure that the potential impacts of both onshore and offshore infrastructure are considered on a cumulative basis, an additional high level overview report will be prepared. This will present a summary of the key findings of the different assessments and also highlight any potential inter-Project cumulative effects which may occur, along with providing an assessment on their potential significance.

19.5 References

- Ref 19-1** HM Government (2017). The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017. Available at: <https://www.legislation.gov.uk/uksi/2017/572/contents>
- Ref 19-2** Planning Inspectorate (2024). Nationally Significant Infrastructure Projects: Advice on Cumulative Effects Assessment. Available at: <https://www.gov.uk/guidance/nationally-significant-infrastructure-projects-advice-on-cumulative-effects-assessment>
- Ref 19-3** National Infrastructure Planning website. Available at: <https://national-infrastructure-consenting.planninginspectorate.gov.uk/project-search>
- Ref 19-4** Landstat Land Data & Intelligent. Available at: <https://www.landstack.co.uk/>

20. Summary and Next Steps

20.1 Summary

- 20.1.1 This Scoping Report is part of notification under Regulation 8(1)(b) of the EIA Regulations which states that the Applicant will undertake an EIA in respect of the Proposed Development and produce an ES to report the findings of the EIA.
- 20.1.2 It also supports a formal application to PINS under Regulation 10(3) of the Infrastructure Planning (EIA) Regulations 2017 for a 'Scoping Opinion' as to information to be provided within the ES that will form part of the DCO application.
- 20.1.3 The Scoping Report sets out the environmental effects that are considered to have the potential to be significant and proposes the approach to be used in assessments that will be undertaken for the EIA to characterise and understand the significance of these effects. A summary of the disciplines and topics proposed to be included within the EIA have been included with each technical chapter of this document (Chapters 5 to 18), and a summary of the topics to be included are outlined in the proposed ES table of contents provided in Table 20-1.
- 20.1.4 This Scoping Report will inform consultation and enable key stakeholders to comment on the proposed structure, methodology, and content of the ES. Further details on the proposed structure of the ES are provided in the next section.

20.2 Proposed Structure of the Environmental Statement

- 20.2.1 It is currently proposed that the ES will be structured into nine volumes, as is illustrated in Plate 20-1.
- ES Volume I: Non-Technical Summary;
 - ES Volume II: ES Introductory Chapters & Methodology;
 - ES Volume III: Breedon Capture Facility;
 - ES Volume IV: Tarmac Capture Facility;
 - ES Volume V: Buxton Lime Capture Facility;
 - ES Volume VI: Holcim Capture Facility;
 - ES Volume VII: Peak Cluster Pipeline;
 - ES Volume VIII: Coastal AGI to MLWS Pipeline(s); and
 - ES Volume IX: Overarching & Cumulative Assessment.

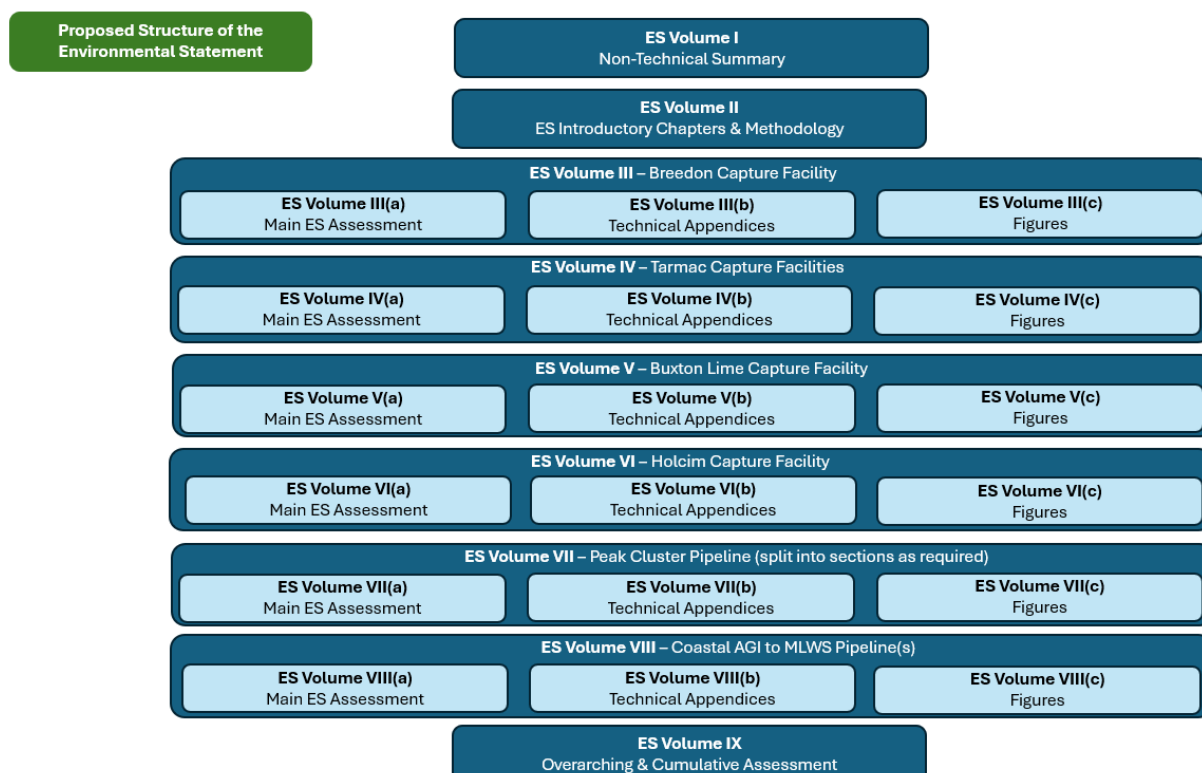


Plate 20-1: Proposed Structure of the ES

20.2.2 It is currently envisioned that ES Volumes III to VIII will be split into three parts, labelled as (a), (b) and (c), split as follows:

- Volume a - Main Text: This will form the main body of the ES for the corresponding element of the Proposed Development, detailing the results of the environmental assessment, likely significant effects arising from the Proposed Development, and the proposed mitigation measures. The ES will also identify opportunities for social and economic benefits and environmental enhancement. The ES will be divided into a number of technical chapters;
- Volume b - Appendices: A complete set of appendices will be provided for reference. These comprise of background data, technical reports, tables, figures and surveys which support the assessments in ES; and
- Volume c - Figures: A complete set of figures will be provided for reference which support the assessments in ES.

20.2.3 Further details are provided within Table 20-1. This will be confirmed following receipt of any scoping representations.

Table 20-1: Proposed Structure of the ES

Proposed Structure of the ES
ES Volume I: ES Non-Technical Summary (NTS)
The ES NTS will be presented in a separate document and provides a concise description of the Proposed Development, the considered alternatives, baseline, assessment methodology, potential environmental effects and mitigation measures. The ES NTS will be designed to provide information on the Proposed Development in an accessible format which can be understood by a wide audience and to assist interested parties with their familiarisation of the Proposed Development, including via a digital platform.

Proposed Structure of the ES

ES Volume II: Introductory Chapters and Methodology

ES Volume II ES Introductory Chapters & Methodology include the front-end chapters of the Environmental Statement which cover all elements of the Proposed Development and comprise of:

- Chapter 1: Introduction;
- Chapter 2: The Proposed Development;
- Chapter 3: Project Alternatives;
- Chapter 4: Planning Policy and Need;
- Chapter 5: EIA Methodology;
- Chapter 6: Stakeholder Engagement.

This volume will also include Appendices and Figures where required.

ES Volume III to VII

These will comprise of three separate parts as follows;

Volume (a) Main Assessment: This will detail the results of the environmental assessment associated with the development associated with each ES Volume, the likely significant environmental effects, and the proposed mitigation measures, and include the following chapters:

- Chapter 1: Overview of relevant component of the Proposed Development
- Chapter 2: Air Quality;
- Chapter 3: Noise and Vibration;
- Chapter 4: Traffic and Movement;
- Chapter 5: Landscape and Visual;
- Chapter 6: Historic Environment;
- Chapter 7: Biodiversity;
- Chapter 8: Water Environment and Flood Risk;
- Chapter 9: Geology and Ground Conditions;
- Chapter 10: Socio-economics,
- Chapter 11: Human Health; and
- Chapter 12: Summary of Significant Environmental Effects

Volume (b) Technical Appendices: A complete set of appendices will be provided for reference. These comprise of background data, technical reports, tables and surveys which support the assessments.

Volume (c) Figures: A complete set of figures will be provided for reference which support the assessments.

ES Volume VIII: Coastal AGI to MLWS Pipeline(s)

This volume will comprise of three volumes;

Volume (a) Main Assessment: This will detail the results of the environmental assessment associated with the development of the pipeline(s) from Coastal AGI to MLWS, the likely significant environmental effects, and the proposed mitigation measures, and include the following chapters:

- Chapter 1: Overview of the pipeline(s) from Coastal AGI to MLWS component of the Proposed Development;

Proposed Structure of the ES

- Chapter 2: Air Quality;
- Chapter 3: Noise and Vibration;
- Chapter 4: Traffic and Transport;
- Chapter 5: Landscape and Visual;
- Chapter 6: Historic Environment;
- Chapter 7: Biodiversity;
- Chapter 8: Water Environment and Flood Risk;
- Chapter 9: Geology and Ground Conditions;
- Chapter 10: Socio-economics;
- Chapter 11: Human Health;
- Chapter 12: Marine Biodiversity;
- Chapter 13: Marine Transport and Navigation;
- Chapter 14: Historic Environment (Marine);
- Chapter 15: Physical Processes;
- Chapter 16: Summary of Significant Environmental Effects.

Volume (b) Technical Appendices: A complete set of appendices will be provided for reference. These comprise of background data, technical reports, tables, figures and surveys which support the assessments in ES Volume VI(a)

Volume (c) Figures: A complete set of figures will be provided for reference which support the assessments in ES Volume VI(a).

ES Volume IX: Overarching & Cumulative Assessment

This volume will comprise of three volumes;

ES Volume IX (a) Main Assessment: This will detail the results of the overarching environmental assessment which span the entirety of the Proposed Development, reporting the likely significant environmental effects, and the proposed mitigation measures. This volume includes the following chapters:

Chapter 1: Major Accidents and Disasters;

Chapter 2: Climate Change;

Chapter 3: Cumulative Effects;

Chapter 4: Materials and Waste; and

Chapter 5: Summary of Significant Environmental Effects.

ES Volume IX (b) Technical Appendices: A complete set of appendices will be provided for reference. These comprise of background data, technical reports, tables, figures and surveys which support the assessments in ES Volume VIII(a).

ES Volume IX (c) Figures: A complete set of figures will be provided for reference which support the assessments in ES Volume VIII(a).

20.3 Next Steps

- 20.3.1 Plate 20-2 provides a high level overview of the key steps the Project team will be undertaking to support this DCO application and the currently identified programme.

- 20.3.2 The Proposed Development is in the process of collecting data, engaging with landowners and undertaking necessary engineering and environmental surveys to help inform the development of the design of the Project and inform the EIA.
- 20.3.3 The Applicant will engage in an initial public consultation event in early 2026 to introduce the Project, its components and emerging preferred location and route alignment.
- 20.3.4 Future consultation will also be undertaken in quarter 4 in 2026. This will provide an opportunity for the Applicant to present the Proposed Development to key stakeholders and local community ahead of submission, in particular highlighting how and where their concerns have been addressed. It also provides an opportunity to understand what concerns remain and may need to be considered post-submission and as part of ongoing design.
- 20.3.5 Environmental and engineering surveys and assessment will continue through 2026 and 2027, working towards a proposed submission of the DCO application (including ES) in 2027.

Peak Cluster CCS – Project Milestones to DCO Application



Plate 20-2: Indicative Timeline for the EIA development and DCO Application