

ENVIRONMENTAL STATEMENT (VOLUME III)

Appendix 11.3 Minerals Resource Assessment

HyNet Carbon Dioxide Pipeline DCO

Planning Act 2008

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

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TABLE OF CONTENTS

1. INTRODUCTION.....	3
1.1. Authorisation	3
1.2. DCO Proposed Development.....	3
1.3. Key terms	4
1.4. Sources of Information	4
2. MINERALS PLANNING POLICY	6
2.1. Background	6
2.2. England	6
2.3. Wales	8
3. SITE DETAILS	11
4. DCO PROPOSED DEVELOPMENT EARTHWORKS & POST DEVELOPMENT INFRASTRUCTURE	14
4.1. DCO Proposed Development earthworks	14
4.2. Post development infrastructure.....	14
5. MINERAL RESOURCES ASSESSMENT METHODOLOGY	15
5.1. Mineral Resource Quality Calculation	15
5.2. Considerations for mineral resource viability	15
6. MINERAL RESOURCE ASSESSMENT	16
6.1. Potential Mineral Resources	16
6.2. Restrictions on non-minerals development	19
6.3. Consultation	19
6.4. Regional Resource Requirement	20
6.5. Potential opportunities for mineral extraction, resource viability, and sterilisation	21
6.6. Incidental Mineral extraction and reuse during development	24
6.7. Conclusions.....	24
7. REFERENCES.....	26

TABLES

Table 1 Section details for the DCO Proposed Development	12
Table 2 Mineral resource extraction criteria	15
Table 3 Summary of MSA intersections	17
Table 4 MSA intersections and their suitability for mineral extraction	22

1. INTRODUCTION

1.1. AUTHORISATION

1.1.1. This report has been prepared on instruction from Liverpool Bay Carbon Capture and Storage (CCS) Limited (the Applicant) in support of a planning consent to facilitate the Applicant's proposal to construct a new underground carbon dioxide pipeline from Cheshire to Flintshire (the Newbuild Carbon Dioxide Pipeline) with associated Above Ground Infrastructure, including Above Ground Installations (AGI) and Block Valve Stations (BVS) (the 'DCO Proposed Development'). An overview of the DCO Proposed Development extent is provided on **Figure 11.3.1** in **Annex A**.

1.2. DCO PROPOSED DEVELOPMENT

1.2.1. The DCO Proposed Development will form part of the HyNet North West Project (the Project), the aim of which is to reduce CO₂ emissions from industry, homes and transport to support economic growth in the North West of England and North Wales. The DCO Proposed Development is classified as a Nationally Significant Infrastructure Project (NSIP) and will require a Development Consent Order (DCO) under the Planning Act 2008. Notably, the draft revision NPS EN-1 (DEFRA 2021) recognises the need for new nationally significant CCS infrastructure and methods for transporting CO₂, including onshore pipelines (this DCO Proposed Development).

1.2.2. The DCO Proposed Development comprises a linear route of approximately 36.7km which has been divided into six Sections (Section 1 to 6) from east to west. Three additional Block Valve Stations (BVS) along the existing Flint Connection to PoA Terminal Pipeline will also be constructed as part of the DCO Proposed Development. The approximate extents are set out below and shown on **Figure 11.3.1** in **Annex A**. This report comprises assessment of land defined by the Newbuild Infrastructure Boundary within which the pipeline will be built. Although the indicative Newbuild Carbon Dioxide Pipeline route may differ slightly with the progressing design, any changes to the route that may occur within the area defined as part of the permanent acquisition of subsurface (see **Figure 3-2, Volume IV**) are not considered likely to alter the outcome of this Minerals Resource Assessment in any significant way. It should be noted that, all development and land space required to construct and operate the DCO Proposed Development will fall within the Newbuild Infrastructure Boundary, including pipeline easements (**Chapter 3 – Description of the DCO Proposed Development, Volume II**).

1.3. KEY TERMS

1.3.1. The following key terms defined below are used throughout this assessment:

- Sterilised – a mineral resource which can no longer be extracted due to non-mineral development; sterilisation can be direct, e.g. by development on land bearing a mineral resource preventing its current or future extraction, or indirect whereby development takes place in proximity to an existing quarry / mineral resource / infrastructure that may be sensitive to impacts such as noise or dust which leads to constraints on extraction or operation, or otherwise restricts access.
- Prior Extraction – the recovery of a mineral resource before development commences which may sterilise the mineral resource.
- Incidental Extraction – extraction of Mineral Resources as a necessity to enable the construction to be accomplished.
- Mineral Safeguarding Area (MSA) – an area designated by a Mineral Planning Authority which covers known deposits of minerals which are desired to be kept safeguarded from unnecessary sterilisation by non-mineral development.
- Overburden – the material overlying the mineral resource, which may be of little or no economic value.
- Section – a division of the Newbuild Carbon Dioxide Pipeline route (Sections 1-6).
- Intersection – an area in which the Newbuild Carbon Dioxide Pipeline route passes through a Mineral Safeguarding Area

1.4. SOURCES OF INFORMATION

1.4.1. The following sources of information have been used in this assessment:

POLICY AND GUIDANCE:

- **Ref 1:** Planning Policy Wales, Welsh Government, Edition 11, February 2021. Referred to as PPW11.
- **Ref. 2:** Flintshire County Council Unitary Development Plan 2000-2015, Adopted 28th September 2011, Chapter 18 Minerals.
- **Ref. 3:** Flintshire County Council Local Development Plan, 2015 – 2030, Deposit Plan September 2019.
- **Ref 4:** Flintshire County Council, Flintshire Deposit Local Development Plan 2015-2030, Background Paper 4 Minerals, September 2019.
- **Ref 5:** Minerals Technical Advice Note 1: Aggregates, Minerals Planning Policy (Wales), Welsh Government, March 2004.
- **Ref 6:** Minerals Technical Advice Note 2: Coal, Minerals Planning Policy (Wales), Welsh Government, January 2009.

- **Ref 7:** Cheshire West and Chester Local Plan (Part one) Strategic Policies, adopted 29 January 2015.
- **Ref 8:** Cheshire West and Chester Local Plan (Part two) Land Allocations and Detailed Policies, adopted 18 July 2019.
- **Ref 9:** British Geological Survey. Mineral Safeguarding in England: Good Practice Advice. Minerals & Waste Programme. Open Report OR/11/046. 2011.
- **Ref 10:** The Mineral Products Association & The Planning Officers' Society. Minerals Safeguarding Practice Guidance. April 2019.
- **Ref 11:** DEFRA. Draft Overarching National Policy Statement for Energy (EN-1). September 2021.

PUBLICLY AVAILABLE INFORMATION:

- **Ref 12:** BGS Geo Index Online Map Viewer [accessed: 09 May 2022]; and,
- **Ref 13:** DEFRA Magic Map Viewer [accessed: 09 May 2022].

REPORTS:

- **Appendix 11-1 Phase 1 Land and Soil (Contaminated Land) Baseline (Volume III)**
- **Appendix 11-6: Phase II Geoenvironmental Ground Investigation Report (Volume III)**
- **Outline Soil Management Plan and Peat Management Plan, Appendix 4 of the OCEMP (Document reference: D.6.5.4)**

OTHER:

- **Ref 14:** Mee, K., Marchant, B.P., Mankelow, J.M. and Bide, T.P., 2019. Modelling the distribution and quality of sand and gravel resources in 3D: a case study in the Thames Basin, UK. Environmental Modelling & Assessment, 24(5), pp.585-603.

2. MINERALS PLANNING POLICY

2.1. BACKGROUND

2.1.1. The Newbuild Carbon Dioxide Pipeline crosses the border from England to Wales within Section 4. As a result, this Minerals Resource Assessment must comply with legislation from both England and Wales:

- The England National Planning Policy Framework (NPPF) (**Ref. 15**)
- Planning Policy Wales (PPW) (**Ref. 1**)

2.2. ENGLAND

2.2.1. The NPPF (Paragraph 204) (**Ref. 15**) requires that planning policies should safeguard mineral resources of local and national importance against needless sterilisation from non-mineral developments. In addition, Paragraph 206 states that local planning authorities should not normally permit other development in Mineral Safeguarding Areas (MSA) if it might constrain potential future use for mineral working.

2.2.2. MSAs are set out by Mineral Planning Authorities (MPA), which in the case of this development is the county council – Cheshire West and Chester Council (CWCC). The MPA take on responsibility for planning minerals extraction, associated development, and waste management facilities. The CWCC Local Plan outlines how this will be achieved. This is split into two parts:

- Cheshire West and Chester Local Plan Part 1 – Strategic Policies (2015) (**Ref. 7**)
- Cheshire West and Chester Local Plan Part 2 – Land Allocations and Detailed Policies (2019) (**Ref. 8**)

2.2.3. Relevant policies to this assessment from each of these documents are outlined below.

CHESHIRE WEST AND CHESTER LOCAL PLAN PART 1 (2015)

Policy ENV9

2.2.4. Policy ENV9 states that ‘CWCC will make provision for the adequate, steady and sustainable supply of sand, gravel, salt and brine, contributing to the sub-national guidelines for aggregate land-won sand and gravel, whilst ensuring the prudent use of our important natural finite resources.’ This policy underpins the need for safeguarding of mineral resources in the CWCC MPA area. Policy ENV9 is shown in **Annex B**

CHESHIRE WEST AND CHESTER LOCAL PLAN PART 2 – LAND ALLOCATIONS AND DETAILED POLICIES (2018)

Policy M1 – Future sand and gravel working

2.2.5. Policy M1 (shown in full in **Annex B**) of Part 2 of the Local Plan is in line with the Local Plan (Part 1) policy ENV9 and states that the Council will maintain a steady and adequate supply of aggregate land-won sand and gravel throughout the plan period and a minimum seven-year landbank (**Ref. 7-8**). The policy presents allocated sites for sand and gravel extraction, which will be safeguarded against non-mineral development that may sterilise their ability to supply sand and gravel. Policy M1 states the following requirements for delivery of the Local Plan ENV9 sand and gravel tonnage:

- A. *the continued provision of sand and gravel from the permitted reserves at the following existing sites – Cheshire Sands, Oakmere; Forest Hill, Sandiway; Cobden Farm, Oakmere; and Town Farm, Kingsley.*
- B. *the allocation of a site for sand and gravel north of the railway to extend Forest Hill, Sandiway.*
- C. *the identification of a Preferred Area at Moss Farm and north of the railway forming an extension to Forest Hill, Sandiway.*
- D. *the identification of an Area of Search.*

The four existing sites and the allocated site...will be safeguarded against non-mineral development that prejudices their ability to supply sand and gravel.

2.2.6. The route of the Newbuild Carbon Dioxide Pipeline is not located at or in the vicinity of an allocated site, based on the list of sites presented within Policy M1 and review of the interactive Local Plan.

Policy M2 - Mineral Safeguarding areas – prior extraction of minerals

2.2.7. Policy M2 (shown in full in **Annex B**) identifies circumstances under which non-mineral or hydrocarbon development will be supported in a mineral safeguarding area (**Ref. 7-8**). Relevant to this assessment, this includes circumstances where:

1. *Mineral sterilisation will not occur; or*
2. *The quantity or quality of the mineral it is no longer of any existing or potential value; or*
3. *The mineral can be extracted satisfactorily prior to the incompatible development taking place; or*
4. *The incompatible development is of a temporary nature and can be completed and the site restored to a condition that does not inhibit extraction within the timescale that the mineral is likely to be needed and does not permanently sterilise the mineral; or*

5. *There is an overriding need for the incompatible development and the material planning benefits of the non-mineral or hydrocarbon development would outweigh the material planning benefits of the underlying or adjacent material.*

2.3. WALES

NATIONAL POLICY

2.3.1. Key national land use planning policies are provided by Planning Policy Wales (PPW11) (**Ref. 1**), in particular Section 5.14 which relates to the sustainable extraction of minerals. Supplementary guidance is provided the following Minerals Technical Advice Notes (MTAN):

- Minerals Technical Advice Note 1 (MTAN1): Aggregates, Minerals Planning Policy (Wales), providing guidance on how the land use planning system should contribute to the sustainable supply of aggregates and sets out detailed advice on aggregates, such as limestone, sand and gravel (**Ref. 5**)
- Minerals Technical Advice Note 2 (MTAN2): Coal, Minerals Planning Policy (Wales), providing guidance on how the land use planning system should contribute to the sustainable supply of coal and requires local authorities to direct coal working away from sensitive locations and indicates those areas where coal should not be worked (**Ref. 6**).

LOCAL DEVELOPMENT PLANS

2.3.2. Both the Flintshire County Council's (FCC) Unitary Development Plan (UDP) (Adopted in 2011) (**Ref. 2**) and emerging Local Development Plan (LDP) (**Ref. 3**) have been reviewed in this assessment. The relevant policies in each plan are outlined below and reproduced in full in **Annex B**.

Flintshire County Council Unitary Development Plan (UDP) (2000 – 2015)

2.3.3. The UDP (**Ref. 2**) is the adopted development plan for Flintshire for the fifteen-year period 2000 – 2015, and although the UDP became time expired at the end of 2015 it remains the adopted development plan for the County. Chapter 18 of the UDP provides the guidance framework for minerals extraction; of relevance are the following policies:

MIN2 (Mineral Development)

2.3.4. Proposals for the working or recovery of minerals will be assessed with regard to various criteria, including if the development will not have a significant adverse impact on sites of international, national, regional or local environmental, nature conservation, landscape and/or heritage importance, and the River Dee Estuary.

MIN8 (Protection of Mineral Interests)

2.3.5. The key points for MIN8 are:

- Any non-mineral development within a MSA will be required to demonstrate reasonable justification for sterilisation or restriction of mineral resources.
- Coal resources are required to be safeguarded

MIN10 (Mineral Buffer Zones)

2.3.6. MIN10 establishes the principle of a mineral buffer zone which prohibits development of new mineral workings and seeks to prevent sterilisation.

2.3.7. The policies are reproduced in full in **Annex C**.

Flintshire County Council Local Development Plan (LDP) (2015 – 2030)

2.3.8. The emerging LDP (**Ref. 3**) sets out Flintshire's proposals for future development and use of land in their area and will supersede the UDP once it has been adopted. The LDP was submitted for examination in October 2020. It could be argued that more weight is given in planning considerations to the policies of the emerging plan (in line with PPW11) than the UDP.

2.3.9. The following policies are applicable to this assessment:

EN23 Minerals Safeguarding

2.3.10. Policy EN23 is reproduced below:

“Non-mineral development within Mineral Safeguarding Areas as defined on the proposals map will only be permitted where it can be demonstrated that:

- a. The mineral underlying the site does not merit extraction, or*
- b. The need for the non-mineral development outweighs the need to protect the resource, or*
- c. The mineral can be satisfactorily extracted prior to the non-mineral development, or*
- d. The development is of a temporary nature or can be removed within the timescales within which the mineral is likely to be needed, and*
- e. Essential infrastructure that supports the supply of minerals would not be compromised or would be provided elsewhere.*

All applications for development, with the exception of householder applications, in these areas shall be supported by a Mineral Safeguarding Assessment.

Proposals for non-mineral development on sites of 4ha or more, which are underlain by Category 1 sand and gravels shall be supported by a Prior Extraction Assessment.

2.3.11. The emerging LDP, in line with PPW11, no longer requires coal to be safeguarded (**Ref. 1 & 3**). The following extract from LDP Background Paper 4 (Minerals) (**Ref. 4**), September 2019 is presented below. It should be noted that the Minerals Paper was published before PPW11 and therefore refers to PPW10; PPW11 still affirms the approach below.

“PPW10 reaffirms this approach and, in particular removes the need to safeguard coal resources. PPW10 states that LPAs may wish to safeguard primary coal depending on their individual circumstances. As there are no specific circumstances within Flintshire to warrant the safeguarding of coal resources, the Minerals Safeguarding Areas no longer safeguard coal resources and the proposals maps does not contain a coal Mineral Safeguarding Areas. Furthermore, there would be no requirement within Policy EN23 for sites underlain by coal to provide a prior extraction assessment.”

2.3.12. The reclassification of coal as a non-safeguarded mineral is reflected in the Minerals Safeguarding Areas (MSA) defined on the LDP proposals map.

2.3.13. For the purposes of this assessment, coal is disregarded due to it no longer being classified as a safeguarded mineral resource (see **Section 3.3**)

EN24: Minerals Buffer Zone

2.3.14. Policy EN24 is reproduced below:

“Development in the minerals buffer zones as identified on the Proposals Map will only be permitted where it can be demonstrated that it would not compromise current or planned mineral extraction.”

2.3.15. The Indicative Newbuild Carbon Dioxide Pipeline does not intersect with a Minerals Buffer Zone.

3. SITE DETAILS

- 3.1.1. The Indicative Newbuild Carbon Dioxide Pipeline Section divisions are described in detail in **Chapter 3 – Description of the DCO Proposed Development, Volume II**. MSAs relevant to the DCO Proposed Development are displayed in **Figure 11.3.7** in **Annex A**. Pertinent site details for each of the Sections is provided within **Annexes C-I**, and summarised below in **Table 1**. The geology encountered throughout the Newbuild Carbon Dioxide Pipeline route is also shown in **Figure 11.3.2, Sheet 1-6** in **Annex A**. The **Phase 1 Land and Soil (Contaminated Land) Baseline report** (shown in **Appendix 11-1, Volume III**) also outlines the site details for the entire scheme in detail. Information from the British Geological Survey and the ground investigation conducted along the length of the Newbuild Carbon Dioxide Pipeline route has been utilised herein (borehole logs are available in **Annex J**, and the **Ground Investigation Report** is found in **Appendix 11-5, Volume III**).

Table 1 Section details for the DCO Proposed Development

	Section 1	Section 2	Section 3	Section 4	Section 5	Section 6	Section 7		
							Babell BVS	Pentre Halkyn BVS	Cornist Lane BVS
Superficial Geology (aquifer status)	Alluvium (Secondary A) Glacial Till (Secondary) Tidal Flat Deposits (Secondary)	Alluvium (Secondary A) Tidal flat deposits (Secondary) Glaciofluvial Deposits (Secondary A) Alluvial Fan deposits (Secondary A) Blown Sand (Secondary A) Peat (Secondary)* Glacial Till (Secondary)	Tidal Flat Deposits (Secondary) Glaciofluvial Deposits (Secondary A) Glacial Till (Secondary)	Tidal Flat Deposits (Secondary) Glacial Till (Secondary)	Glaciofluvial deposits (Secondary A) Glacial Till (Secondary) Peat (Secondary)* Head Deposits (Secondary)	Glaciofluvial Deposits (Secondary A) Glacial Till (Secondary) Head Deposits (Secondary)	Glacial Till (Secondary) Glaciofluvial Deposits (Secondary A) Head Deposits (Secondary)	Glacial Till (Secondary) Glaciofluvial Deposits (Secondary A)	Glacial Till (Secondary)
Bedrock Geology (aquifer status)	Kinnerton Sandstone Formation (Principal) Chester Formation (Principal)	Wilmslow Sandstone Formation (Principal) Chester Formation (Principal)	Kinnerton Sandstone Formation (Principal) Chester Formation (Principal)	Kinnerton Sandstone Formation (Principal) Eturia Formation (Secondary A) Pennine Middle Coal Measure Formation (Secondary A) Pennine Lower Coal Measure Formation (Principal)	Gwespyr Sandstone (Secondary A) Eturia Formation (Secondary A) Hollin Rock (Secondary A) Bowland Shale Formation (Secondary) Pennine Middle Coal Formation (Secondary A) Pennine Lower Coal Formation (Secondary A)	Gwespyr Sandstone (Secondary A) Pennine Middle Coal Measure Formation (Secondary A) Pennine Lower Coal Formation (Secondary A)	Cefn Mawr Limestone (Principal)	The Loggerhead Limestone (Principal)	Bowland Shale Formation (Secondary) Gwespyr Sandstone (Secondary A)
Safeguarded Mineral Resources	Sand & Gravel	Sand & Gravel	Sand & Gravel	Brick Clay	Sand & Gravel	Sand & Gravel	Superficial: sand and gravels Bedrock: Limestone	Superficial: sand and gravels Bedrock: High Purity Limestone	None identified.

	Section 1	Section 2	Section 3	Section 4	Section 5	Section 6	Section 7		
							Babell BVS	Pentre Halkyn BVS	Cornist Lane BVS
Hydrology	Intersects Gale Brook (tributary of River Gowy), West Central Drain, East Central Drain, and Hornsmill Brook	Intersects River Gowy and Mill Brook in the east of the Section south of the M56 Shropshire Grand Union Canal is crossed in the west of the Section	Runs adjacent the Shropshire Grand Canal and intersects Backford Brook in the east of the Section	Intersects the Afon Dyfrdw and Broughton Brook.	Intersects Alltami Brook 0.9km southeast of Northop hall Country Primary School	Intersects Northop brook 1km northeast of Northop	The Afon Wys river is located 380m south. Unnamed Land Drain situated approximately 660m east.	No features within 1km.	Small unnamed drain located approximately 110m northeast. Afon Nant-y-Fflint stream is located approximately immediately west, with several small unnamed drains located further west. Unnamed pond located approximately 385m to the north.
Sensitive land uses which could prejudice future mineral workings	None within 50m	None within 50m	None within 50m	Intersects Afon Dyfrdwy SSSI	Runs adjacent the Connah's Quay Ponds and Wetlands SSSI and associated Ancient Woodland	None within 50m	None within 50m	None within 50m	None within 50m

an Outline Peat Management Plan (reference included in **Section 1.4) has been prepared which highlights how peat intersected by the DCO Proposed Development could be best managed by the Construction Contractor responsible for installation of the pipeline.*

4. DCO PROPOSED DEVELOPMENT EARTHWORKS & POST DEVELOPMENT INFRASTRUCTURE

4.1. DCO PROPOSED DEVELOPMENT EARTHWORKS

- 4.1.1. The Newbuild Carbon Dioxide Pipeline will be below ground for its entire length (except at AGIs and BVSs). Open cut trench excavations will be used for most of the DCO Proposed Development. This entails digging a trench with mechanical excavators or specialised trenching machines. The depth of the trench is variable but will typically be in the range of 2.5-6m, whilst the width will likely be approximately 3-4m throughout. Construction will be the same as that for a natural gas transmission pipeline, involving excavation of an open trench, lowering the pipe into the trench, and backfilling with granular material. Screened granular material will be used for bedding in the trench, and upon installation of the pipeline, the trench will be backfilled with arisings in the reverse order to which it was excavated.

4.2. POST DEVELOPMENT INFRASTRUCTURE

- 4.2.1. Following installation of the Newbuild Carbon Dioxide Pipeline and reinstatement of ground, previous land uses that will not impact on the pipeline structure can resume (**Chapter 3 – Description of the DCO Proposed Development, Volume II**). It is assumed that vehicular access and existing infrastructure will not be compromised by the presence of the Newbuild Carbon Dioxide Pipeline. If new infrastructure is required, such as that associated with minerals extraction, it is assumed that reinforced access crossings for plant may be installed at intersections with the pipeline following consultation with the Applicant, and that such access would not be unreasonably refused. Mineral extraction will not be permitted within the pipeline easements however.

5. MINERAL RESOURCES ASSESSMENT METHODOLOGY

5.1. MINERAL RESOURCE QUALITY CALCULATION

5.1.1. Where the DCO Proposed Development influences mineral resources within a MSA, the quality of the mineral resource is assessed to determine its economic viability. Mineral resource quality is assessed using the criteria outlined by Mee et al. (2019) (**Ref 14**) Exploratory hole records are analysed, where available, to determine this information. Where particle size data is not available, the depositional environment is analysed to deduce the likely quality of the mineral resource and its homogeneity. Groundwater level is also considered in this assessment.

Table 2 Mineral resource extraction criteria

Category A Deposit	Category B Deposit
The deposit should average at least 2m thickness.	The deposit should average at least 2m thickness
Ratio of overburden to mineral should not exceed 1:1.	Ratio of overburden to mineral should exceed 2:1.
The proportion of fines (particles passing 0.063mm British Standards sieve) should not exceed 20%.	The proportion of fines (particles passing 0.063mm British Standards sieve) should not exceed 40%.
The deposit should lie within 5m of the surface	The deposit should lie within 10m of the surface.

5.2. CONSIDERATIONS FOR MINERAL RESOURCE VIABILITY

5.2.1. The assessment of mineral resource viability (see **Annex C to Annex I**) is influenced by factors other than mineral resource quality, and also takes into consideration pertinent factors. These can include the following:

- Built constraints, such as sensitive adjacent receptors, existing development / infrastructure (including utilities) which have sterilised mineral resource or impacts on the workability of mineral resources;
- Ecological / land use constraints, such as protected areas (e.g. SSSIs, AONBs), listed buildings / heritage assets, footpath networks etc.;
- Availability of nearby processing facilities and the impact HGV traffic may have on local infrastructure, air quality, and noise; and
- Workability of the mineral resource, for example the size of the remaining area of unsterilised mineral resources and total volume, the size of the quarry that may be needed to safely excavate mineral resources, the surrounding constraints that may need to be considered for a mineral development, supporting infrastructure, etc.

6. MINERAL RESOURCE ASSESSMENT

6.1. POTENTIAL MINERAL RESOURCES

- 6.1.1. An assessment of the mineral resources which the Newbuild Carbon Dioxide Pipeline may influence is given in **Annexes C-I**, divided into the predefined Sections. Where a MSA is intersected by the Newbuild Carbon Dioxide Pipeline, this is referred to as an intersection reference. MSAs that are intersected are summarised in **Table 3**.
- 6.1.2. Ground investigations to date as part of the DCO Proposed Development have focussed on providing information to the emerging design and have not been specific to Mineral Resources. As a result, the wider MSAs influenced by the Newbuild Carbon Dioxide Pipeline have not been investigated in detail. Whilst design information is available, ground investigation information targeted at MSAs is not. Resultantly, a meaningful calculation of total resource volume cannot be obtained, as any volumes presented may be incorrect / misleading. Additional information may become available if further ground investigation is undertaken however this is unlikely to materially alter the outcome of this assessment and therefore no further update to the assessment is deemed necessary at this time.
- 6.1.3. Where the Newbuild Carbon Dioxide Pipeline intersects an MSA, the immediate area has been assessed to establish whether existing land uses have already sterilised the mineral resources, or if extraction may be viable. Existing land uses that have been assessed include prior development, protected areas (e.g. SSSIs), and infrastructure. Included within this are overhead power cables and similar infrastructure. A buffer of 16.3m has been applied to all areas already sterilised, as this was considered the most appropriate clearance distance from power cables (**Ref. 16**), as well as a suitable standoff from most development. The area of the MSA not impacted by these land uses has been measured as the area of potentially workable mineral resources that may be influenced by the Newbuild Carbon Dioxide Pipeline route.

Table 3 Summary of MSA intersections

Section	Intersection reference (Figure)	Safeguarded deposit	Area of potentially workable mineral resource influenced by Newbuild Carbon Dioxide Pipeline route (ha)
1	1a (Figure 11.3.3, Sheet 1 in Annex A)	Sand & gravel	0.43
2	2a (Figure 11.3.3, Sheet 2 in Annex A)	Sand & gravel	10.2
	2b (Figure 11.3.3, Sheet 3 in Annex A)	Sand & gravel	3
3	3a (Figure 11.3.3, Sheet 4 in Annex A)	Sand & Gravel	0
4	4a (Figure 11.3.3, Sheet 5 in Annex A)	Brick clay	26
	4b (Figure 11.3.3, Sheet 5 in Annex A)	Brick clay	0
5	5a (Figure 11.3.3, Sheet 6 in Annex A)	Sand & gravel	32
	5b (Figure 11.3.3, Sheet 7 in Annex A)	Sand & gravel	0
6	6a (Figure 11.3.3, Sheet 8 in Annex A)	Sand & gravel	75

Section	Intersection reference (Figure)	Safeguarded deposit	Area of potentially workable mineral resource influenced by Newbuild Carbon Dioxide Pipeline route (ha)
7	Babell BVS (Figure 11.3.5, Sheet 1 in Annex A)	Sand & gravel Limestone	0.95 2.67
7	Pentre Halkyn BVS (Figure 11.3.5, Sheet 3 in Annex A)	Sand & gravel High Purity Limestone	0.58 2.13
7	Cornist Lane BVS (Figure 11.3.5, Sheet 2 in Annex A)	No mineral resource identified and not within an MSA	0

6.1.4. Due to the absence of workable mineral resource within Section 3 and at Intersections 4b and 5b, no further assessment has been undertaken for these locations.

6.2. RESTRICTIONS ON NON-MINERALS DEVELOPMENT

6.2.1. For Sections covered by the CWCC Minerals Planning Authority (Sections 1-4) Policy ENV9 and M2 (**Ref. 7 and Ref. 8**) state that areas located within a MSA will be protected from inappropriate developments. The proposed route of the Newbuild Carbon Dioxide Pipeline encroaches on multiple MSAs identified in the CWCC Local Plan, and so a Minerals Resource Assessment is required (provided by this document) to assess whether the DCO Proposed Development could needlessly sterilise future extraction.

6.2.2. Similarly, for sections covered by the Flintshire Minerals Planning Authority (Sections 4-6), MSAs are protected from unnecessary sterilisation by directing new development away from areas underlain by minerals of economic importance, or where this is not possible, through the requirement for prior extraction (**Ref. 2-3**). As the Newbuild Carbon Dioxide Pipeline intersects MSAs within Flintshire, a Minerals Resource Assessment is also required (provided by this document) to assess whether prior extraction of mineral resources is necessary.

6.3. CONSULTATION

CESHIRE WEST AND CHESTER COUNCIL

6.3.1. CWCC's Minerals Planning Policy team were contacted to confirm the scope of this assessment and to request any site-specific or local information which might be of relevance. The Mineral Planning Officer confirmed that the Newbuild Carbon Dioxide Pipeline route intersects several MSAs within the area covered by CWCC and a Minerals Resource Assessment (this document) will be required to highlight how the pipeline will not needlessly sterilise finite natural resources.

6.3.2. Additionally, it was highlighted that consideration should be given to whether the extraction of sand and gravel from MSA could be used to refill the pipeline trench rather than import this material from further away.

6.3.3. The full correspondence is included as **Annex K**.

3.11.3 FLINTSHIRE COUNTY COUNCIL

- 6.3.4. FCC were contacted to confirm the scope of this assessment and to request any site specific or local information which might be of relevance. FCC advised that the Newbuild Carbon Dioxide Pipeline route intersects brick clay, primary shallow coal reserves, glaciofluvial deposits, and secondary shallow coal. Despite this, it was suggested that some of these mineral resources may already be sterilised by existing build development, including an appropriate buffer zone. It was highlighted that the minerals resource assessment (this document) should consider wider sterilisation of unconstrained mineral resources. It was also advised that prior extraction of mineral resources should be considered where possible.
- 6.3.5. The full correspondence is included as **Annex K**.

LOCAL OPERATORS

TARMAC

- 6.3.6. TARMAC operate Crown Farm Sand & Gravel Quarry in Oakmere, approximately 13 miles southwest of Thornton Manor, Thornton le Moors, as well as another quarry in Mold, Flintshire. Tarmac were approached for an informal opinion on whether they would consider the areas referred to as Intersection 2a and Intersection 2b as potentially workable mineral extraction opportunities, to which they declined.

Hanson Aggregates

- 6.3.7. Hanson Aggregates operate Cefn Mawr Quarry in Mold, approximately 7 miles west of Ewloe Green, Flintshire. Hanson Aggregates were approached for an informal opinion on whether they would consider the area referred to as Intersection 5a as a potentially workable mineral extraction opportunity. A summary of their response detailed below, whilst the full correspondence is included within **Annex A**.

‘From a desk-based review of lands and planning constraints, the site would appear to present significant design, operational, amenity and environmental challenges and would need to hold a significant reserve to justify considering further.’

6.4. REGIONAL RESOURCE REQUIREMENT

CESHIRE WEST AND CHESTER COUNCIL

- 6.4.1. Policy ENV9 of the CWCC LDP states that a minimum seven-year landbank for aggregate land-won sand and gravel will be maintained. The most recent annual monitoring report from the North West Aggregate Working Party (2019) stated that the existing land bank contained a 7.24 year supply of sand and gravel (**Ref. 17**).

FLINTSHIRE COUNTY COUNCIL

- 6.4.2. The Flintshire LDP states that a minimum 10-year land bank of crushed rock and minimum 7 year land bank of sand and gravel to be maintained throughout the LDP period (**Ref. 3**). Where a land bank can provide for over 20 years of extraction, new allocations will not be necessary and proposals for further extractions should not be permitted apart from in exceptional circumstances (**Ref. 5**).
- 6.4.3. The Flintshire existing land bank for crushed rock is 14.3 years, and for land-won sand and gravel aggregates is 6.1 years (**Ref. 18**) .

6.5. POTENTIAL OPPORTUNITIES FOR MINERAL EXTRACTION, RESOURCE VIABILITY, AND STERILISATION

- 6.5.1. Each of the MSAs that are intersected by the Newbuild Carbon Dioxide Pipeline route are assessed in terms of the mineral quality and economic viability of mineral extraction, with reference to relevant legislation / policies in detail in **Annexes C-I**. This information is summarised in **Table 4** below.
- 6.5.2. It should be noted that Policy M2 of CWCC's Local Plan Part 2 (**Ref. 8**), and Policy EN23 of FCC's emerging Local Development Plan (**Ref. 3**) are deemed relevant throughout, as the need / benefit of the DCO Proposed Development is believed to outweigh the need to protect the safeguarded minerals encountered, due to its status as a NSIP.

Table 4 MSA intersections and their suitability for mineral extraction

Section / Intersection reference	Mineral Resource	Area of MSA potentially influenced (ha)	Area of extractable mineral resource post development (ha)	Minerals Planning Authority	Relevant policies	Comments
1a (Figure 11.3.3, Sheet 1 in Annex A)	Sand & gravel	0.43	0.27	Cheshire West & Chester Council	Policy M2	MSA is already partially sterilised by existing development where the Indicative Newbuild Carbon Dioxide Pipeline Route intersects, and the remaining area is not considered a viable minerals prospect. Mineral resource quality does not hold value as a workable prospect.
2a (Figure 11.3.3, Sheet 2 in Annex A)	Sand & gravel	10.2	5.8	Cheshire West & Chester Council	Policy M2	MSA is already partially sterilised by existing development and infrastructure (M56) where Indicative Newbuild Carbon Dioxide Pipeline Route intersects. MSA will remain unsterilised north of the M56 and will be unaffected by the DCO Proposed Development. The area of mineral resources south of the M56 intersected by the DCO Proposed Development may face constraints associated with its proximity to the motorway. Mineral resources south of the M56 which are intersected are of small quantity and potentially poor quality (poorly sorted and/or rich in fine sediment), suggested by depositional environment (Glacial Till / Glacio-Fluvial)
2b (Figure 11.3.3, Sheet 3 in Annex A)	Sand & gravel	3	0	Cheshire West & Chester Council	Policy M2	MSA is already partially sterilised by existing development, overhead electricity cables, and infrastructure (Shropshire Grand Union Canal). Based on this, it is not considered viable for mineral extraction to take place in this area. The remainder of the MSA north of the overhead power cables, which is unsterilised, will be unaffected by the DCO Proposed Development. The overriding significance and need for the DCO Proposed Development is considered to outweigh the value of the mineral resources influenced by the DCO Proposed Development.
3a (Figure 11.3.3, Sheet 4 in Annex A)	Sand & Gravel	0	0	Cheshire West and Chester Council	Policy M2	The southernmost area of the MSA associated with Intersection 3a is sterilised by existing development, leaving the remaining mineral resources in the vicinity of the DCO Proposed Development unsuitable for prior extraction
4a (Figure 11.3.3, Sheet 5 in Annex A)	Brick Clay	26	21	Flintshire County Council	Policy EN23 Policy MIN2	MSA is already partially sterilised by existing development, as well as constrained by the nearby Hawarden airport and the airport safeguarding zone. Deep earthworks associated with quarrying may have adverse environmental impacts to residents including noise, dust, and visual pollution, as well as an increase in congestion associated with mineral workings.
4b (Figure 11.3.3, Sheet 5 in Annex A)	Brick Clay	0	0	Flintshire County Council	-	The mineral resources influenced by the DCO Proposed Development at Intersection 4b are already sterilised by existing development.

Section / Intersection reference	Mineral Resource	Area of MSA potentially influenced (ha)	Area of extractable mineral resource post development (ha)	Minerals Planning Authority	Relevant policies	Comments
5a (Figure 11.3.3, Sheet 6 in Annex A)	Sand & gravel	15.3	8.9	Flintshire County Council	Policy EN23	Moderate quality mineral resource, however, the spatial heterogeneity, as well as the presence of coal within the mineral resource may make it unsuitable for prior extraction
					Policy MIN2	This area is located within a Green Barrier area, as well as adjacent a SSSI. Mineral workings would invade the open character and appearance of this area of countryside, as well as disturb surrounding settlements. Quarry restoration may also increase the risk of bird strikes at the nearby Hawarden Airport.
5b (Figure 11.3.3, Sheet 7 in Annex A)	Brick Clay	0	0	Flintshire County Council	-	The mineral resources influenced by the DCO Proposed Development at Intersection 5b are already sterilised by existing development and are not considered workable.
6a (Figure 11.3.3, Sheet 8 in Annex A)	Sand & gravel	75	72	Flintshire County Council	Policy EN23	Mineral resources generally do not meet the requirements for a Category A or B deposit and contain high contents of clay/silt, as well as a degree of spatial variability. The area of the MSA potentially sterilised by Newbuild Carbon Dioxide Pipeline route is also small.
Babell BVS (Figure 11.3.5, Sheet 1 in Annex A)	Sand and gravel	0.95	0.38	Flintshire County Council	EN23 MIN8	The Site is within an MSA. No data on the quality of mineral resource is available. Due to the small size of the site, the current level of sterilisation at the site (31%) and the availability of crushed rock aggregate across Flintshire the resource is unlikely to merit extraction.
	Limestone	2.67	0.47			The need for the DCO Proposed Development outweighs that of the mineral resources influenced by it.
Pentre Halkyn BVS (Figure 11.3.5, Sheet 3 in Annex A)	Sand and gravel	0.58	0.15	Flintshire County Council	EN23 MIN8	The Sand and gravel resource would be classified as a Category A deposit based on the available PSD data, however the small size of the site, partial distribution of the deposit across the Site and current sterilisation level the mineral resource is unlikely to merit extraction. The land bank of crushed limestone across Flintshire and current sterilisation level means the Limestone resource is unlikely to merit extraction.
	High Purity Limestone	2.13	1.16			It is deemed that the need for the DCO Proposed Development outweighs that of the mineral resources influenced by the DCO Proposed Development.
Cornist Lane BVS (Figure 11.3.5, Sheet 2 in Annex A)	No mineral resource identified and not within an MSA. Not considered further.					

6.6. INCIDENTAL MINERAL EXTRACTION AND REUSE DURING DEVELOPMENT

- 6.6.1. As detailed above, the Newbuild Carbon Dioxide Pipeline route intersects multiple MSAs. Although much of the development will require excavation, some incidental extraction of mineral resources will most likely occur in areas where open cut trench excavations are utilised. Mineral resources that may be incidentally extracted will be reused sustainably as part of a Material Management Plan (MMP) where feasible, which the Construction Contractor should implement (**Chapter 14 – Material Assets and Waste, Volume II**).
- 6.6.2. Where mineral resources are present beneath the DCO Proposed Development but are unlikely to be incidentally extracted, a greater depth of excavation is not considered appropriate. Mineral resources along the length of the DCO Proposed Development predominantly comprise loose sand and gravel. Excavation of such materials would require benching to reach greater depths and maintain stability. As a result, the void created for acquisition of the mineral resources would be significantly larger and also require the import of materials for use as backfill. This would have adverse effects on the sustainability of the DCO Proposed Development during the construction stage, and the likely volume of mineral resource that may be obtained as a result is not likely to be significant. Additionally, the need for benching of the excavation may cause it to extend beyond the Newbuild Infrastructure Boundary.
- 6.6.3. As discussed in **Section 4**, the pipeline trench requires backfilling with granular material as bedding. Many of the safeguarded mineral deposits intersected consist of sand and gravel, which may be suitable for this purpose and would also reduce the volume of sand and gravel that would need to be imported. Any site-won material which is to be used as bedding would require screening / processing. Processing of the material on-site may not be feasible in all areas of development due to space constraints, or worthwhile given the limited volume of incidentally extracted material anticipated. Third-party aggregate operators (such as Tarmac and Hanson) are located within 10-15 miles of some MSAs intercepted by the DCO Proposed Development. However, the adverse effects on infrastructure and sustainability caused by transport of the mineral resources via HGV are likely to outweigh the value of screening / processing the potentially small volumes of mineral resource incidentally extracted. As a result, a more appropriate use of the excavated mineral resource may be for backfilling of the trench, rather than as bedding within trench.

6.7. CONCLUSIONS

- 6.7.1. An assessment of each MSA and their associated resources intersected by the Newbuild Carbon Dioxide Pipeline route referencing relevant legislation / policies has been completed as **Annexes C-I**, with an overview presented as **Table 4**.

- 6.7.2. In summary, geological records highlight that much of the safeguarded mineral resources do not meet the requirements for a quality resource, or face numerous constraints including prior development, protected areas (e.g. SSSIs, Green Barriers, Airport safeguarding zones), or existing infrastructure. Moreover, the benefits of the nationally significant DCO Proposed Development are believed to outweigh the need to protect the safeguarded mineral resources intersected by the Newbuild Carbon Dioxide Pipeline route. Comprehensive detail on this matter is provided in the **Needs Case (Document Reference D.5.5)**.
- 6.7.3. Resultantly, it is considered that none of the safeguarded mineral resources influenced by the Newbuild Carbon Dioxide Pipeline present an economically viable prospect for prior extraction. Despite this, incidental extraction of mineral resource throughout the Newbuild Carbon Dioxide Pipeline route will undoubtedly occur. Where possible, this will be reused within the DCO Proposed Development, given that it is chemically and physically suitable (**Chapter 14 – Material Assets and Waste, Volume II**).

7.

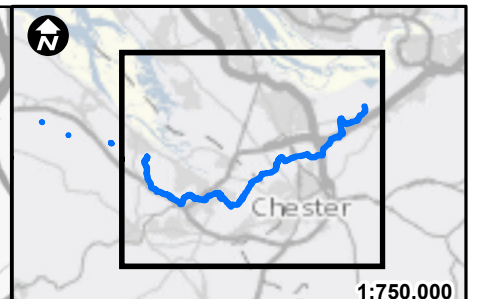
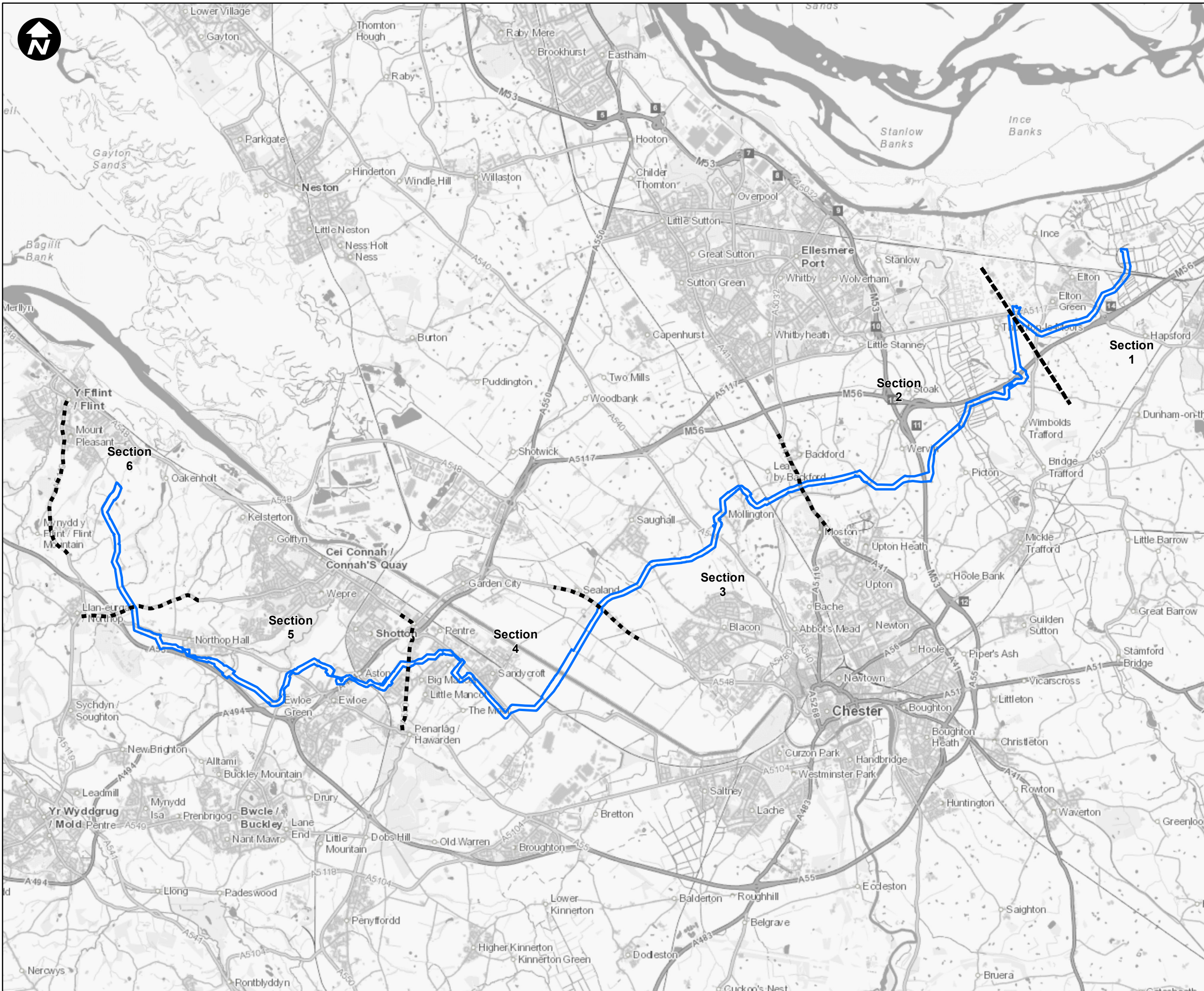
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Annex A

FIGURES



Key:

- Section Divisions
- Permanent acquisition of subsurface

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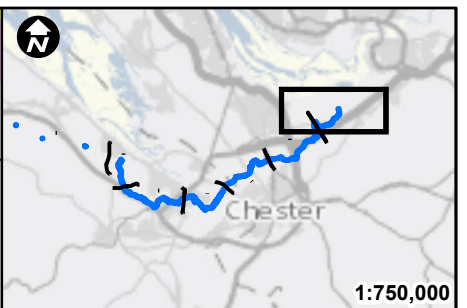
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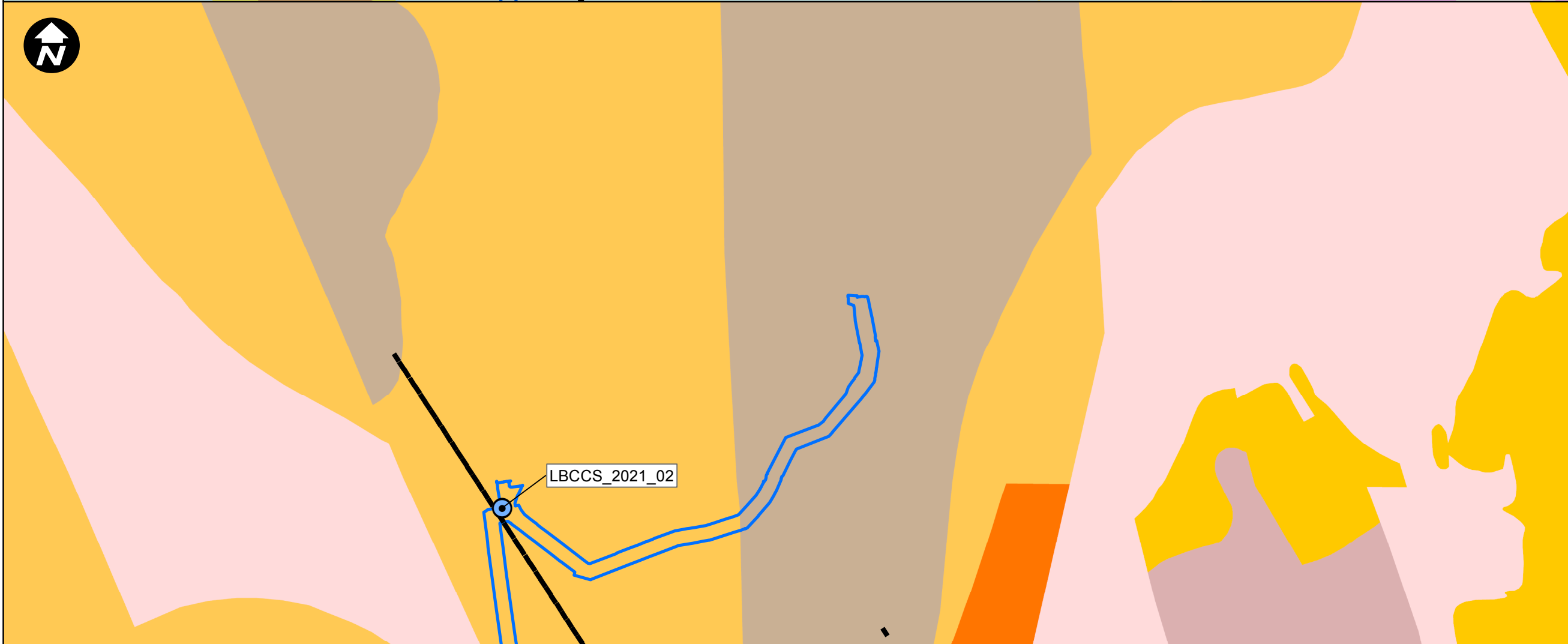
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 - GI exploratory hole records
- Superficial Deposits**
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 - PEAT - PEAT
 - GLACIOFLUVIAL DEPOSITS, DEVENSIAN - SAND AND GRAVEL
 - TILL, DEVENSIAN - DIAMICTON
- Bedrock Geology**
- CHESTER FORMATION - CONGLOMERATE
 - WILMSLOW SANDSTONE FORMATION - SANDSTONE
 - CHESTER FORMATION - SANDSTONE, PEBBLY (GRAVELLY)
 - KINNERTON SANDSTONE FORMATION - SANDSTONE SUPERFICIAL DEPOSITS
 - HELSBY SANDSTONE FORMATION - SANDSTONE, EBBLY (GRAVELLY)
 - TARPALLEY SILTSTONE FORMATION - SILTSTONE, MUDSTONE AND SANDSTONE



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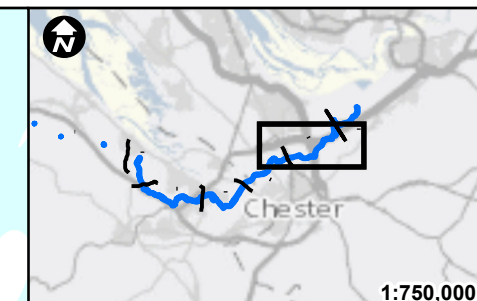
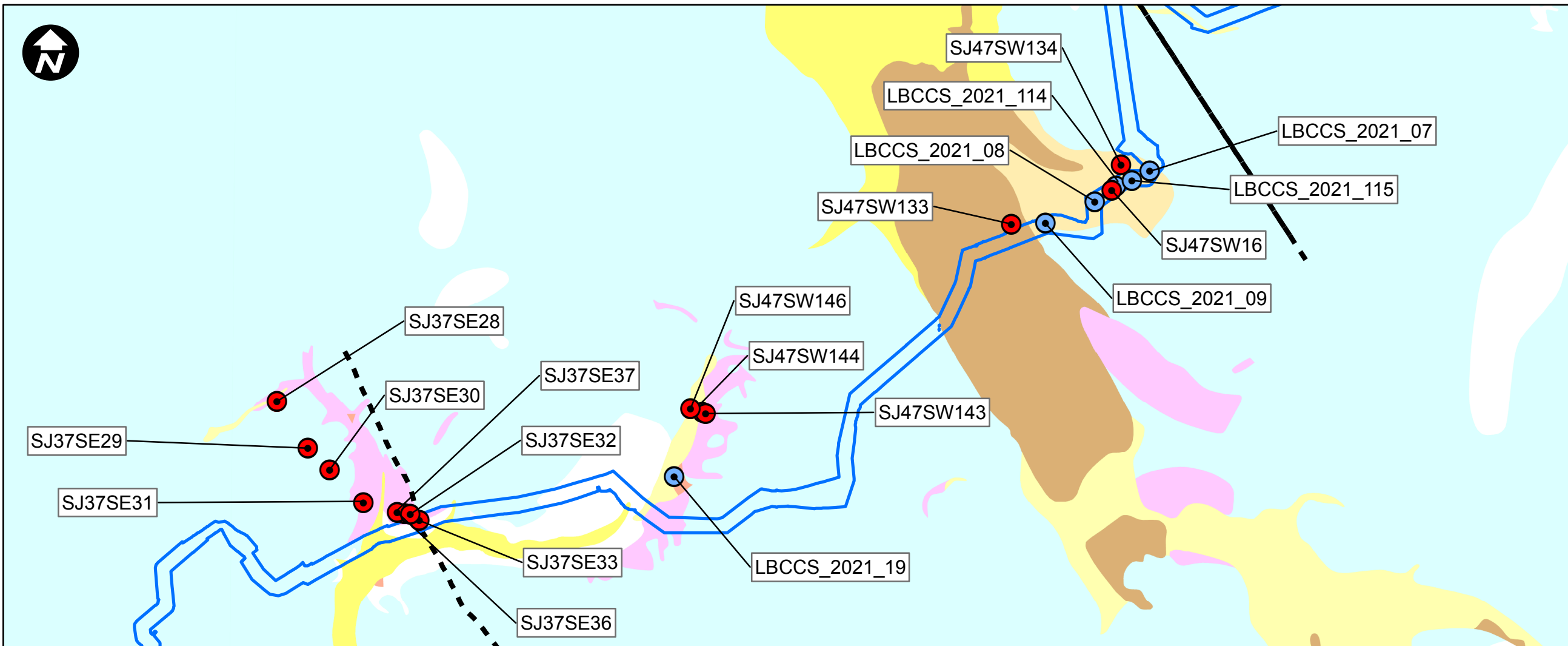
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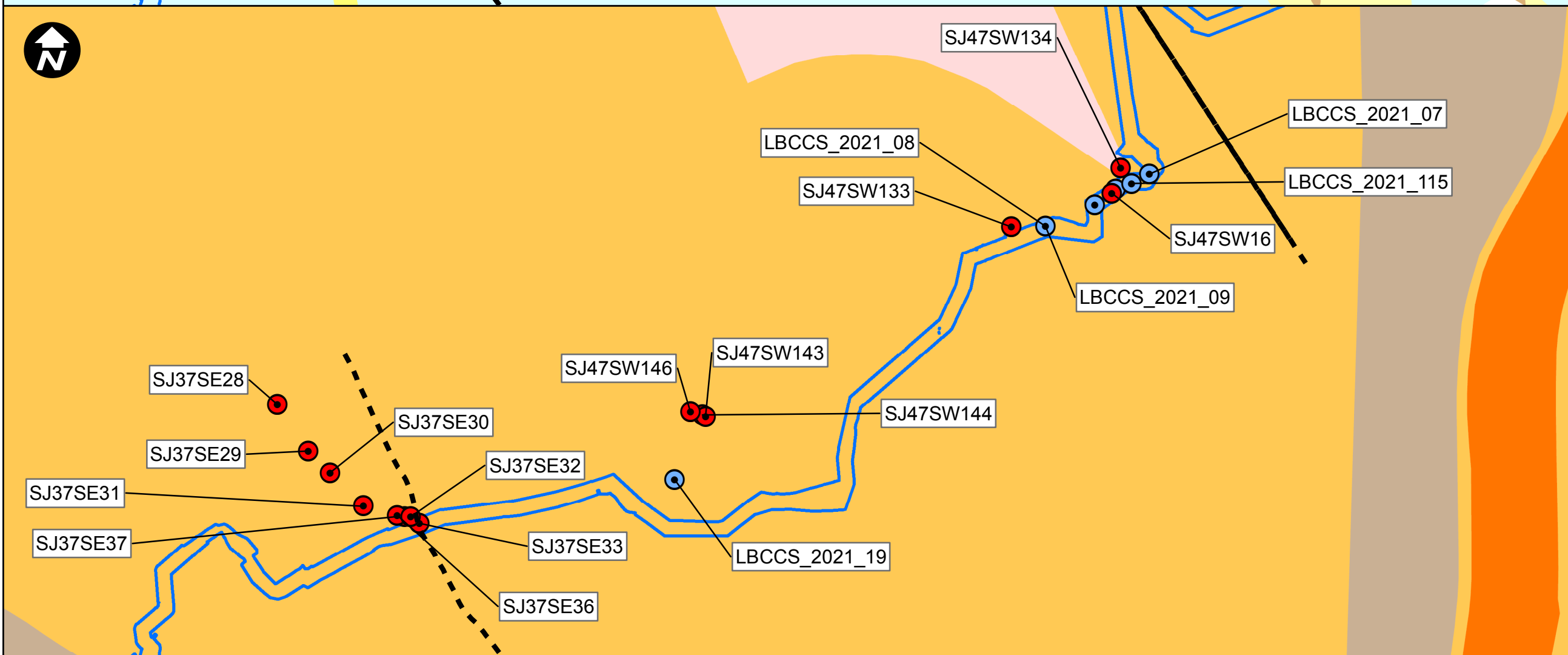
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- Section Divisions
- BGS exploratory hole records
- GI exploratory hole records

Bedrock Geology

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- KINNERTON SANDSTONE FORMATION - SANDSTONE
- SUPERFICIAL DEPOSITS
- CHESTER FORMATION - CONGLOMERATE
- CHESTER FORMATION - SANDSTONE, PEBBLY (GRAVELLY)

Superficial Deposits

- TIDAL FLAT DEPOSITS - CLAY, SILT AND SAND
- ALLUVIAL FAN DEPOSITS - SAND AND GRAVEL
- PEAT - PEAT
- GLACIOFLUVIAL DEPOSITS, DEVENSIAN - SAND AND GRAVEL
- ALLUVIUM - CLAY, SILT SAND AND GRAVEL
- TILL, DEVENSIAN - DIAMICTON
- BLOWN SAND - SAND



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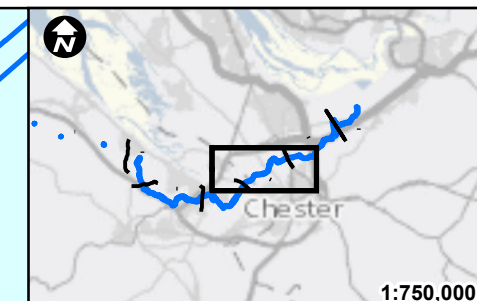
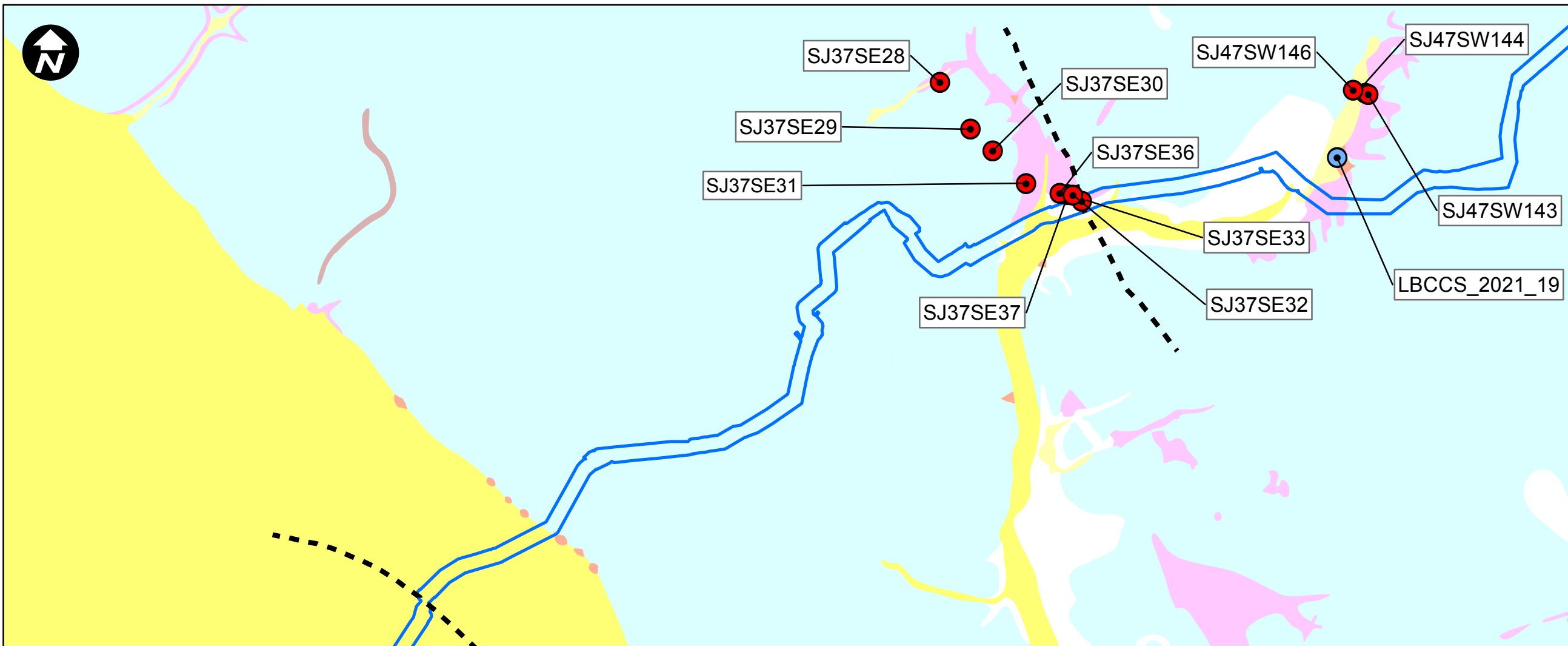
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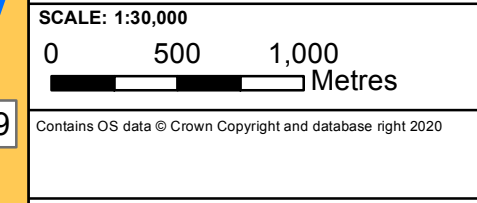
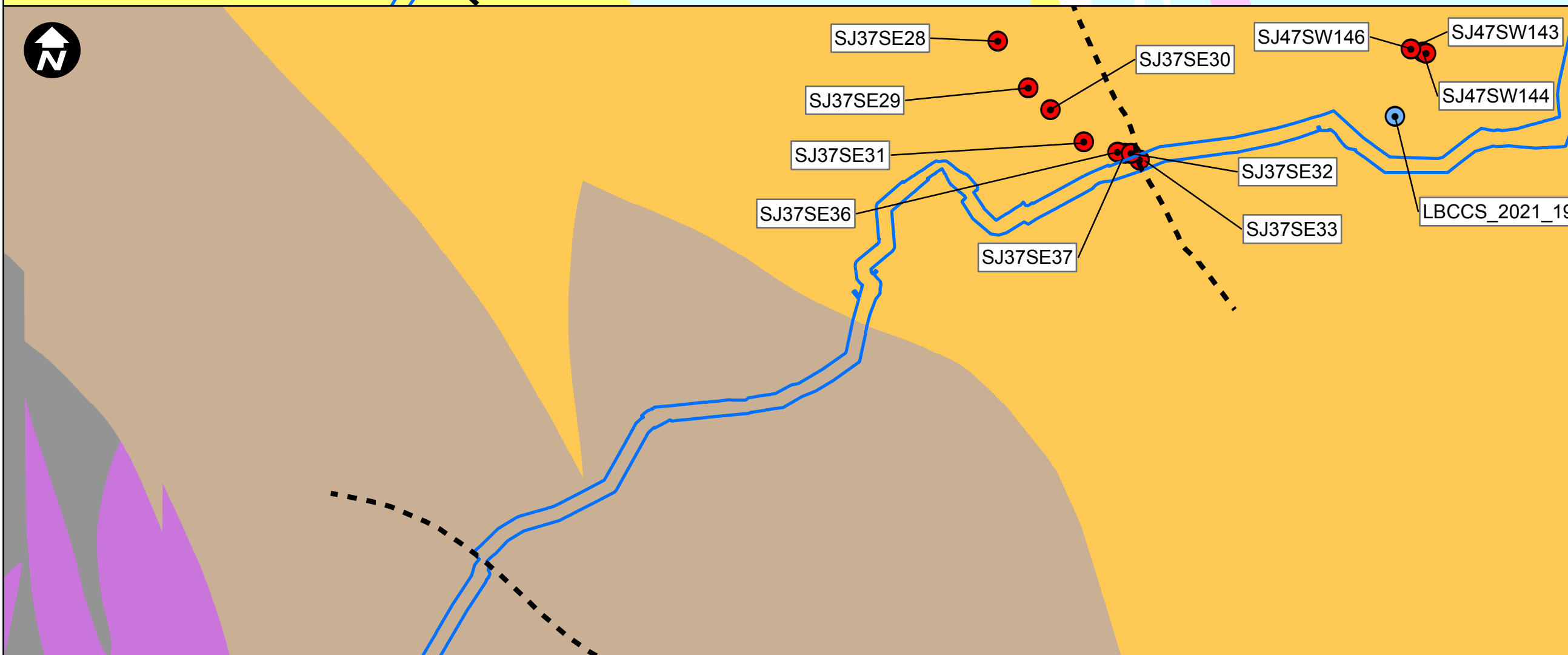
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- Permanent Acquisition of
 - Section Divisions
 - BGS exploratory hole records
 - GI exploratory hole records
- Superficial Deposits**
- ALLUVIAL FAN DEPOSITS - SAND AND GRAVEL
 - TIDAL FLAT DEPOSITS - CLAY, SILT AND SAND
 - GLACIOFLUVIAL DEPOSITS, DEVENSIAN - SAND AND GRAVEL
 - TILL, DEVENSIAN - DIAMICTON
 - ALLUVIUM - CLAY, SILT SAND AND GRAVEL
 - HEAD - CLAY, SILT AND
- Bedrock Geology**
- PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SANDSTONE, SILTSTONE
 - KINNERTON SANDSTONE FORMATION - SANDSTONE SUPERFICIAL DEPOSITS
 - ETRURIA FORMATION - MUDSTONE, SANDSTONE AND CONGLOMERATE
 - PENNINE MIDDLE COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE
 - CHESTER FORMATION - SANDSTONE, PEBBLY (GRAVELLY)



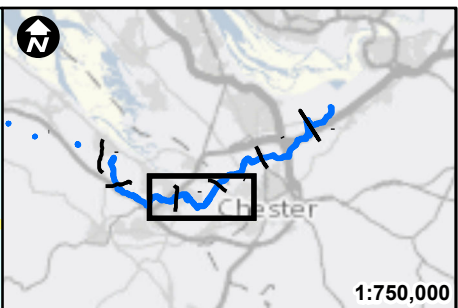
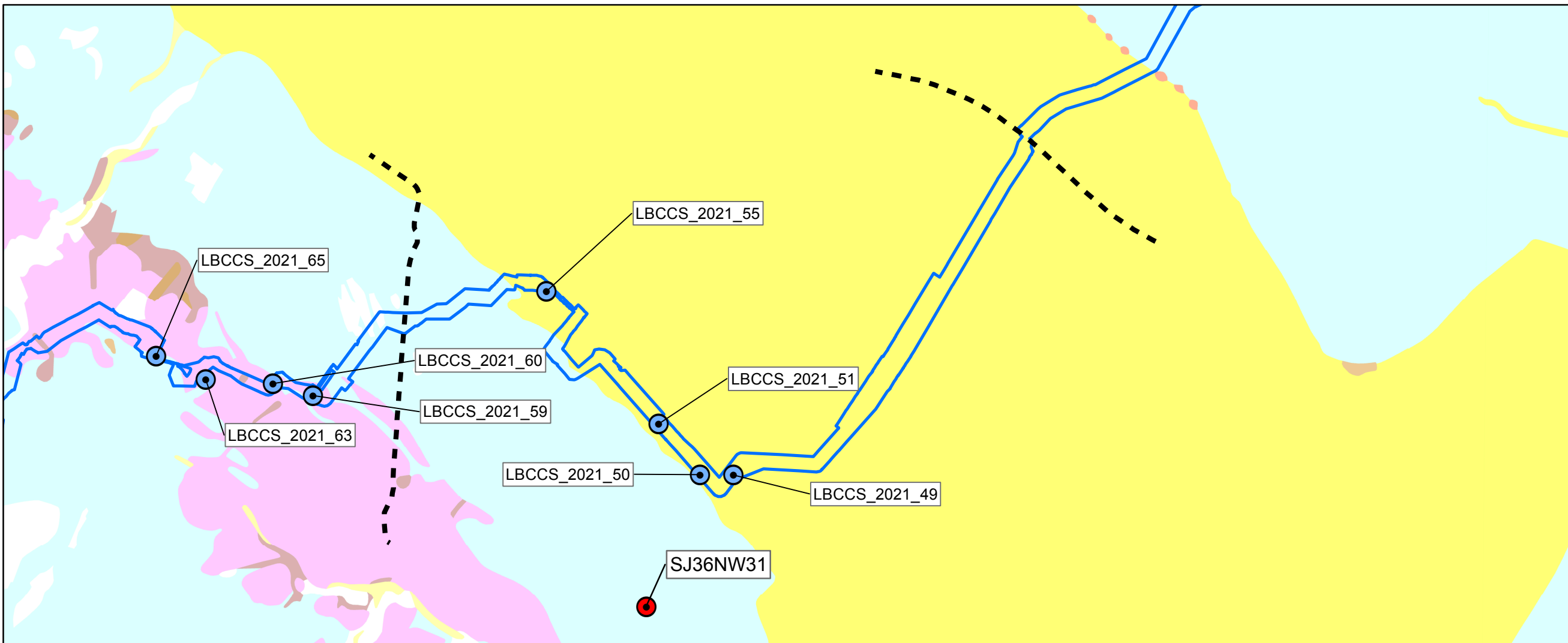
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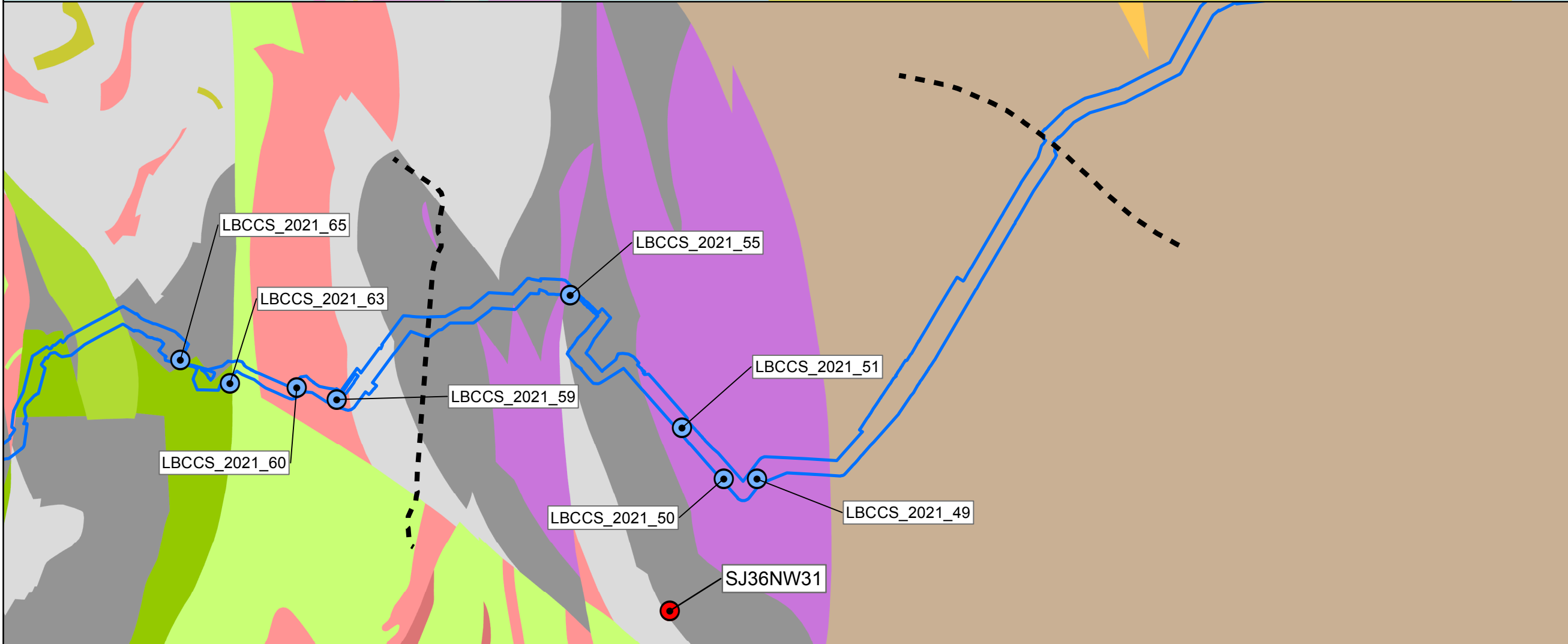
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- Section Divisions
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- GI Exploratory hole records

Bedrock Geology

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- PENNINE LOWER COAL MEASURES FORMATION - SANDSTONE
- HOLLIN ROCK - SANDSTONE
- BOWLAND SHALE FORMATION - MUDSTONE
- KINNERTON SANDSTONE FORMATION - SANDSTONE SUPERFICIAL DEPOSITS
- ETRURIA FORMATION - MUDSTONE, SANDSTONE AND CONGLOMERATE
- PENNINE MIDDLE COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE

Superficial Deposits

- TIDAL FLAT DEPOSITS - CLAY, SILT AND SAND
- GLACIOFLUVIAL DEPOSITS, DEVANSIAN - SAND AND GRAVEL
- TILL, DEVANSIAN - DIAMICTON
- ALLUVIUM - CLAY, SILT SAND AND GRAVEL
- HEAD - CLAY, SILT AND SAND
- LACUSTRINE DEPOSITS - CLAY AND SAND



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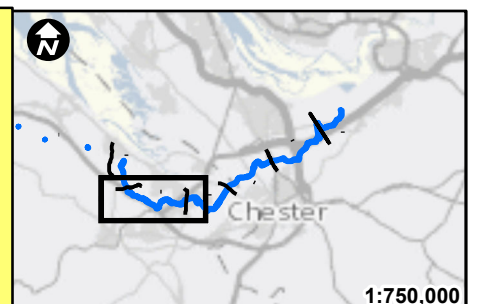
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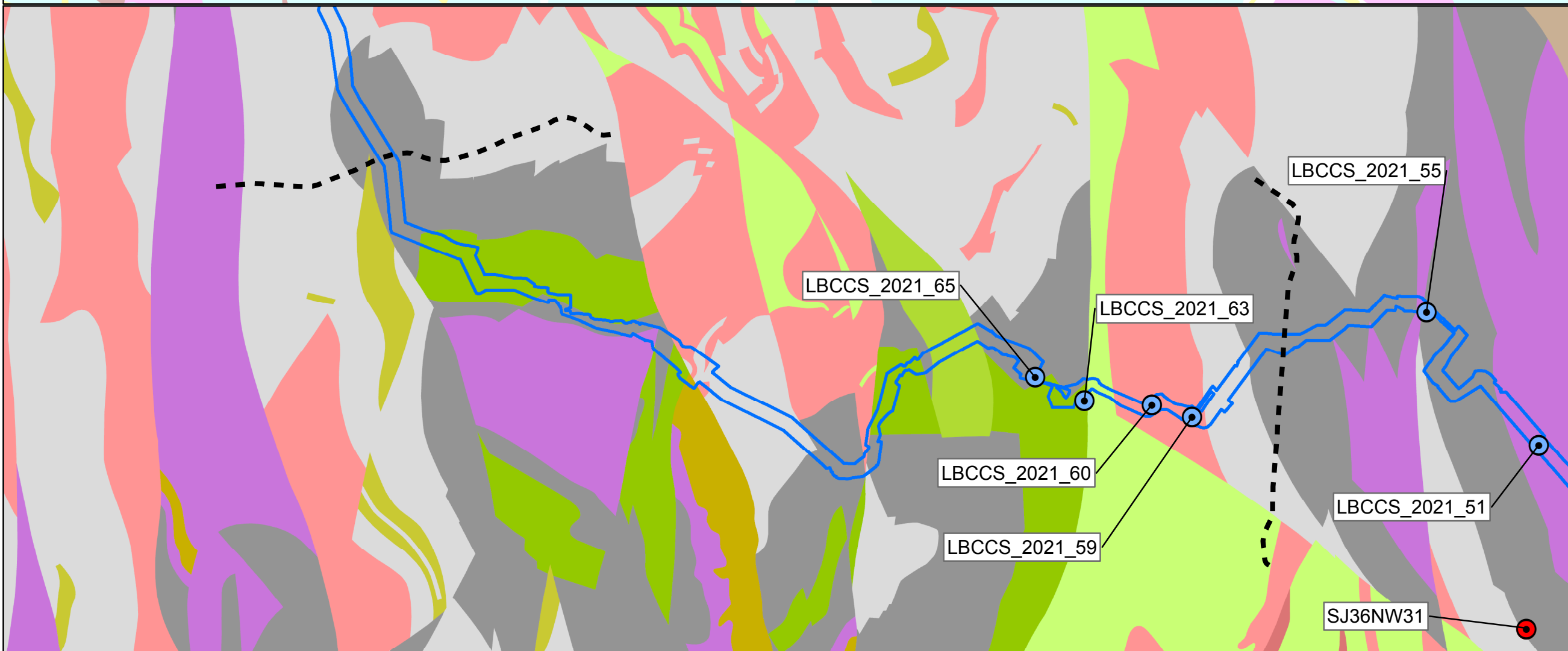
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- GI exploratory hole records

Superficial Deposits

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- TIDAL FLAT DEPOSITS - CLAY, SILT AND SAND
- PEAT - PEAT
- GLACIOFLUVIAL DEPOSITS, DEVENSIAN - SAND AND GRAVEL
- RIVER TERRACE DEPOSITS (UNDIFFERENTIATED) - SAND AND GRAVEL
- TILL, DEVENSIAN - DIAMICTON
- ALLUVIUM - CLAY, SILT SAND AND GRAVEL
- HEAD - CLAY, SILT AND GRAVEL

Bedrock Geology

- ETRURIA FORMATION - SANDSTONE
- PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SANDSTONE, SILTSTONE
- PENNINE LOWER COAL MEASURES FORMATION - SANDSTONE
- HOLLIN ROCK - SANDSTONE
- BOWLAND SHALE FORMATION - MUDSTONE
- PENNINE MIDDLE COAL MEASURES FORMATION - SANDSTONE
- GWESPYR SANDSTONE - SANDSTONE AND [SUBEQUAL/SUBORDINATE] ARGILLACEOUS ROCKS, INTERBEDDED
- ETRURIA FORMATION - MUDSTONE, SANDSTONE AND CONGLOMERATE
- PENNINE MIDDLE COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE



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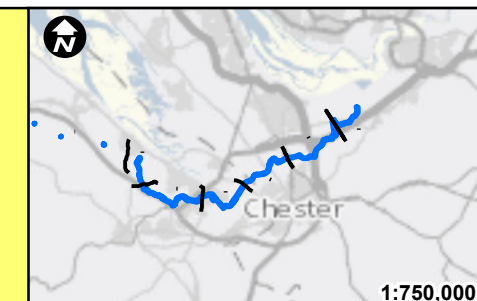
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Figure 11.3.2 Geological Map Sheet 5 of 6

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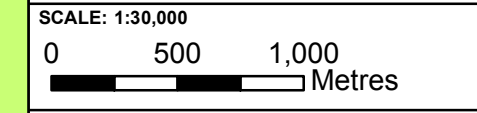
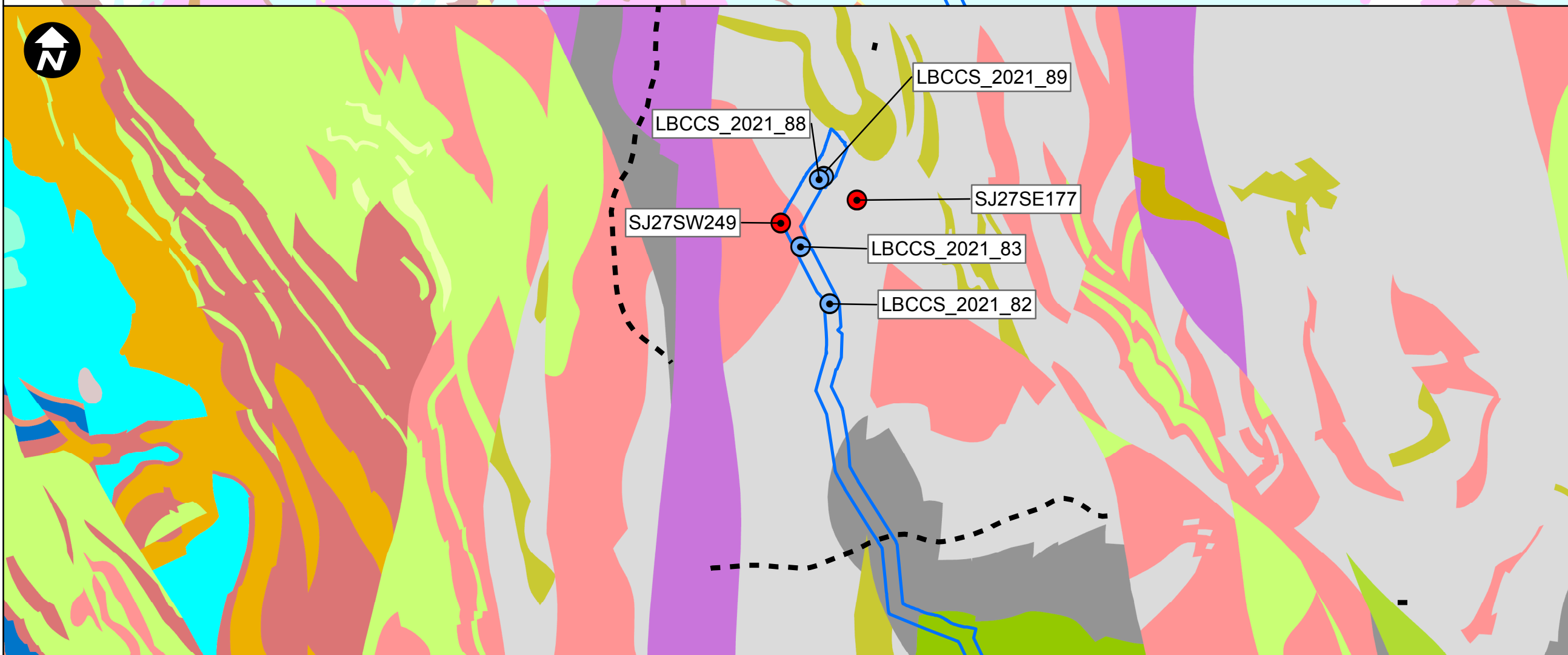
- Permanent acquisition of subsurface
- Section Divisions
- BGS exploratory hole records
- GI Exploratory hole records

Superficial Deposits

- ALLUVIAL FAN DEPOSITS - SAND AND GRAVEL
- TIDAL FLAT DEPOSITS - CLAY, SILT AND SAND
- GLACIOFLUVIAL DEPOSITS, DEVENSIAN - SAND AND GRAVEL
- TILL, DEVENSIAN - DIAMICTON
- ALLUVIUM - CLAY, SILT SAND AND SAND
- HEAD - CLAY, SILT AND GRAVEL

Bedrock Geology

- PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SANDSTONE, SILTSTONE
- PENNINE LOWER COAL MEASURES FORMATION - SANDSTONE
- BOWLAND SHALE FORMATION - MUDSTONE
- CEFN-Y-FEDW SANDSTONE FORMATION - SANDSTONE AND [SUBEQUAL/SUBORDINATE] ARGILLACEOUS ROCKS, INTERBEDDED
- PENNINE MIDDLE COAL MEASURES FORMATION - SANDSTONE
- CEFN MAWR LIMESTONE FORMATION - LIMESTONE AND [SUBEQUAL/SUBORDINATE] ARGILLACEOUS ROCKS, INTERBEDDED
- ETRURIA FORMATION - MUDSTONE, SANDSTONE AND CONGLOMERATE
- BOWLAND SHALE FORMATION - SANDSTONE
- PENTRE CHERT FORMATION - CHERT
- PENNINE MIDDLE COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE



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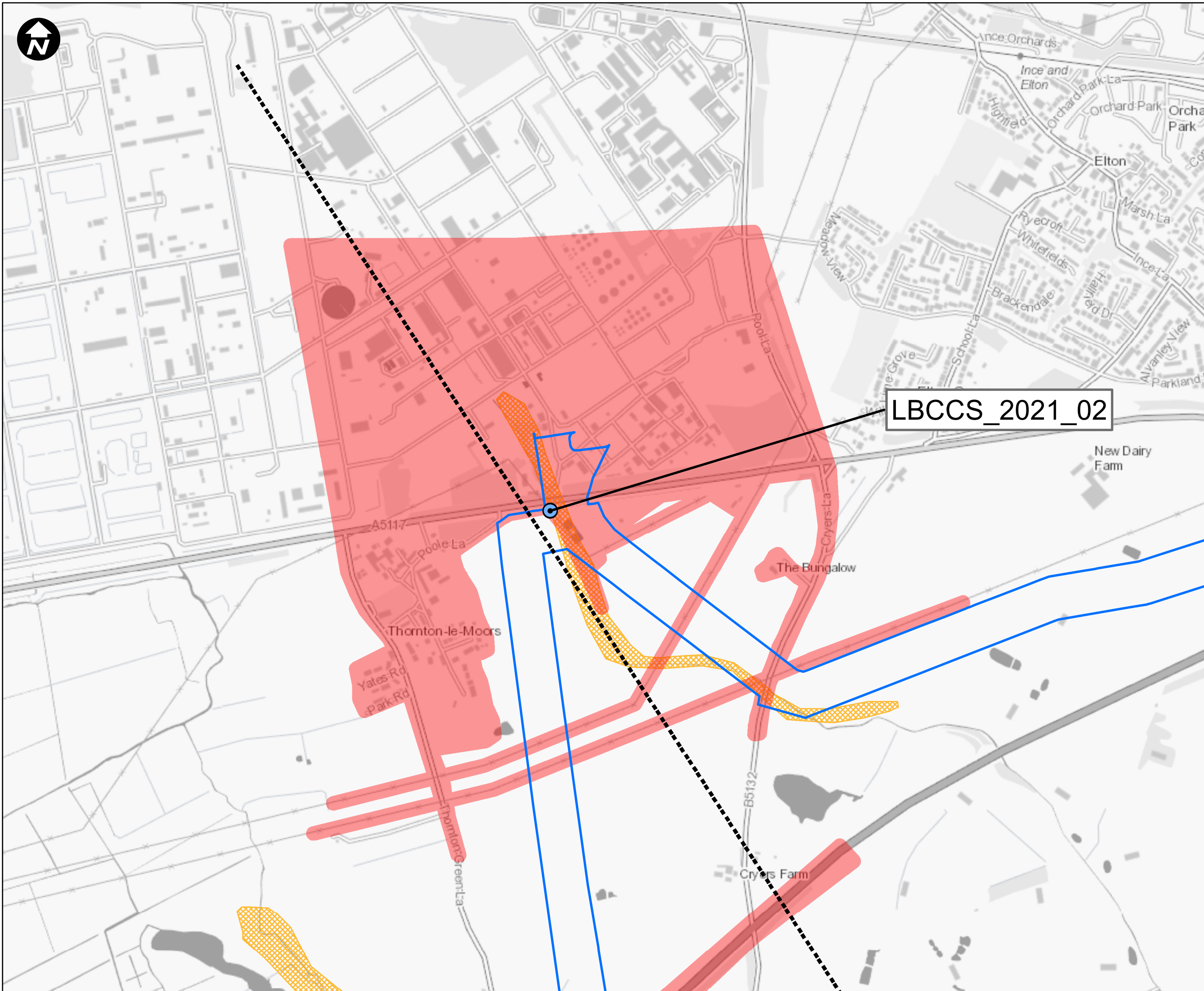
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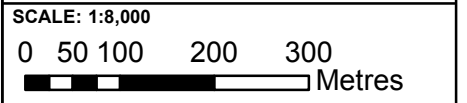
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- Key**
- BGS exploratory hole records
 - Project Exploratory hole records
 - Permanent acquisition of subsurface
 - Sterilised areas +16.3m buffer
 - Mineral Safeguarding Areas
 - Section Divisions

LBCCS_2021_02



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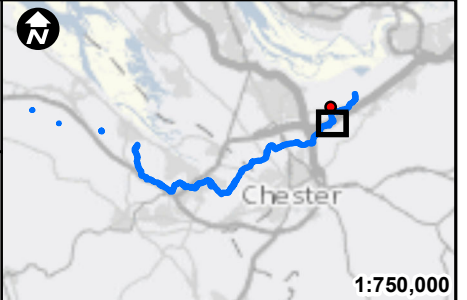
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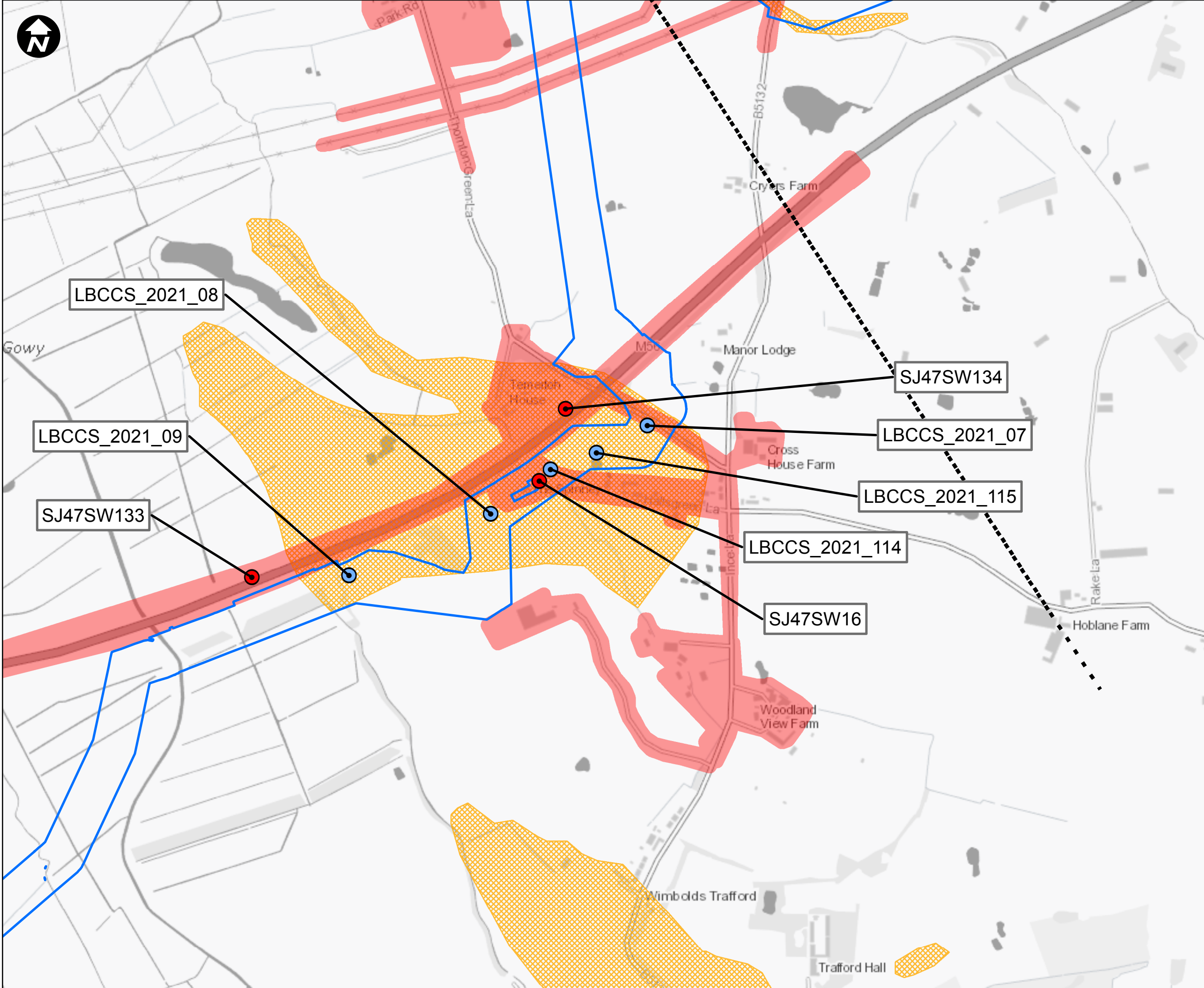
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- Project Exploratory hole records
- Permanent acquisition of subsurface
- Sterilised areas +16.3m buffer
- Mineral Safeguarding Areas
- Section Divisions



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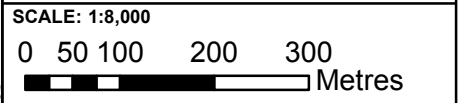
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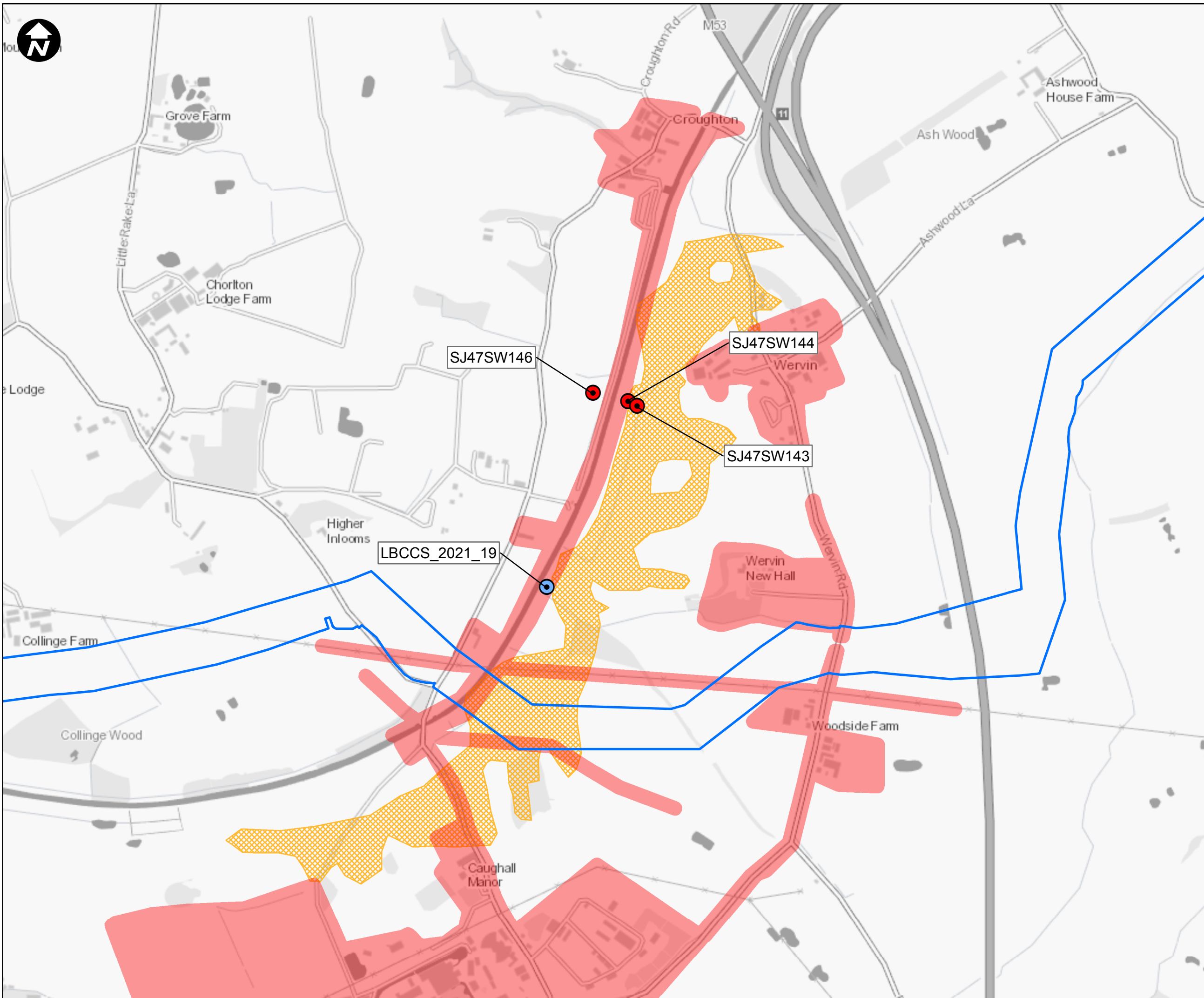
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Sheet 2 of 8

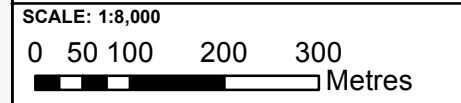
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- Key**
- BGS exploratory hole records
 - Project Exploratory hole records
 - Permanent acquisition of subsurface
 - Sterilised areas +16.3m buffer
 - Mineral Safeguarding Areas
 - Section Divisions



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PROJECT TITLE
HyNet Carbon Dioxide Pipeline DCO

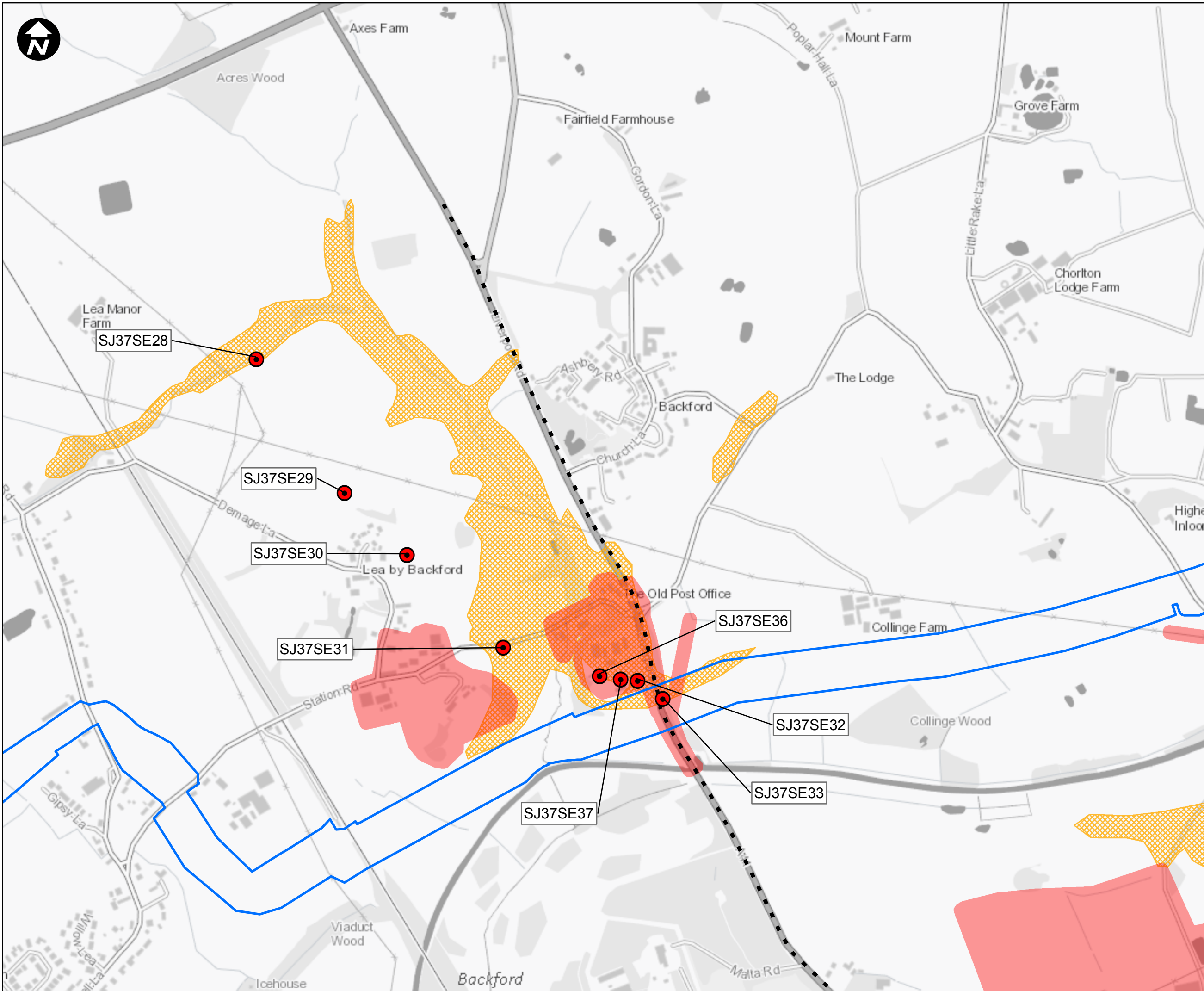
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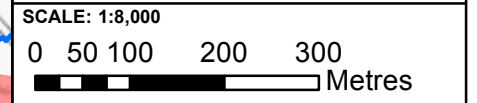
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- Key**
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 - Project Exploratory hole records
 - Permanent acquisition of subsurface
 - Sterilised areas +16.3m buffer
 - Mineral Safeguarding Areas
 - Section Divisions



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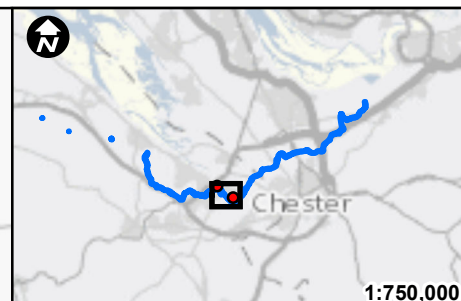
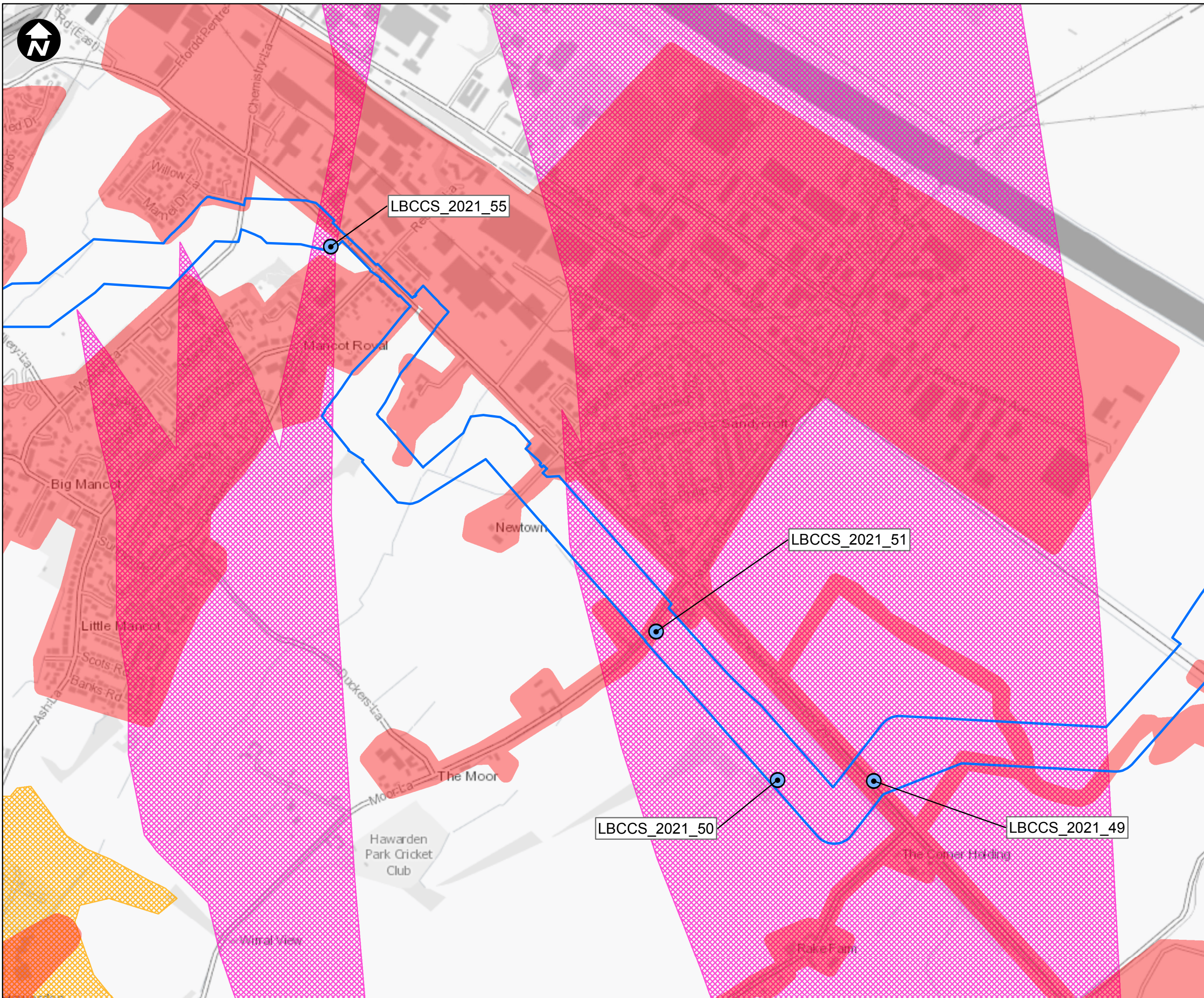
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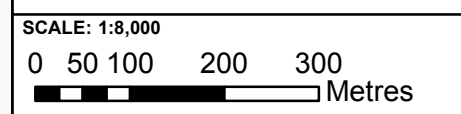
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- Key**
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 - Project Exploratory hole records
 - Permanent acquisition of subsurface
 - Sterilised areas +16.3m buffer
 - Mineral Safeguarding Areas
 - Flintshire additional Safeguarded Minerals: Brick Clay
 - Section Divisions



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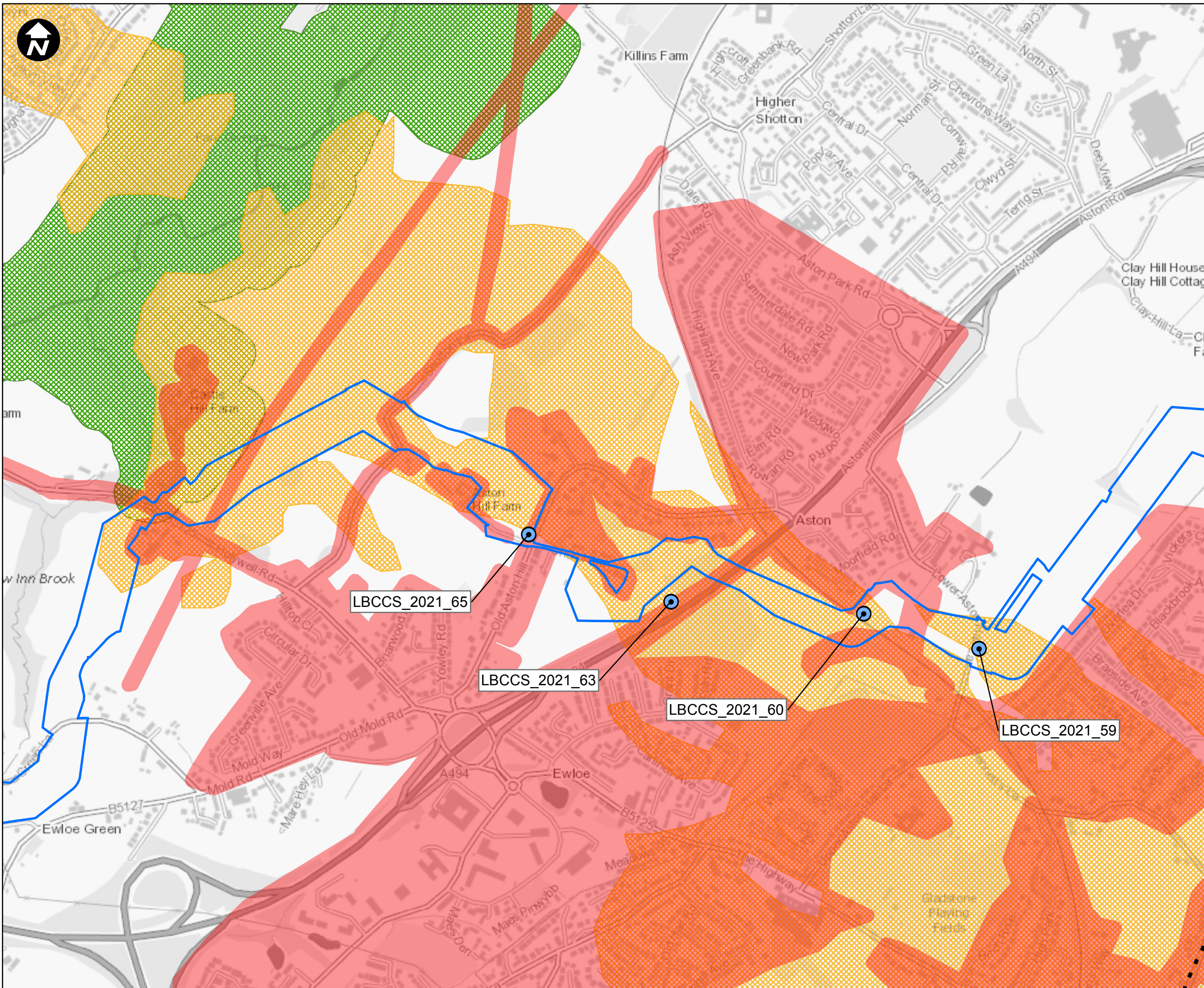
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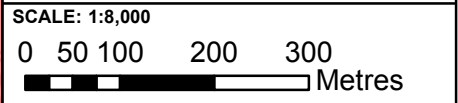
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- BGS exploratory hole records
 - Project Exploratory hole records
 - Permanent acquisition of subsurface
 - Sterilised areas +16.3m buffer
 - Mineral Safeguarding Areas
 - SSSI + 50m Buffer
 - Section Divisions



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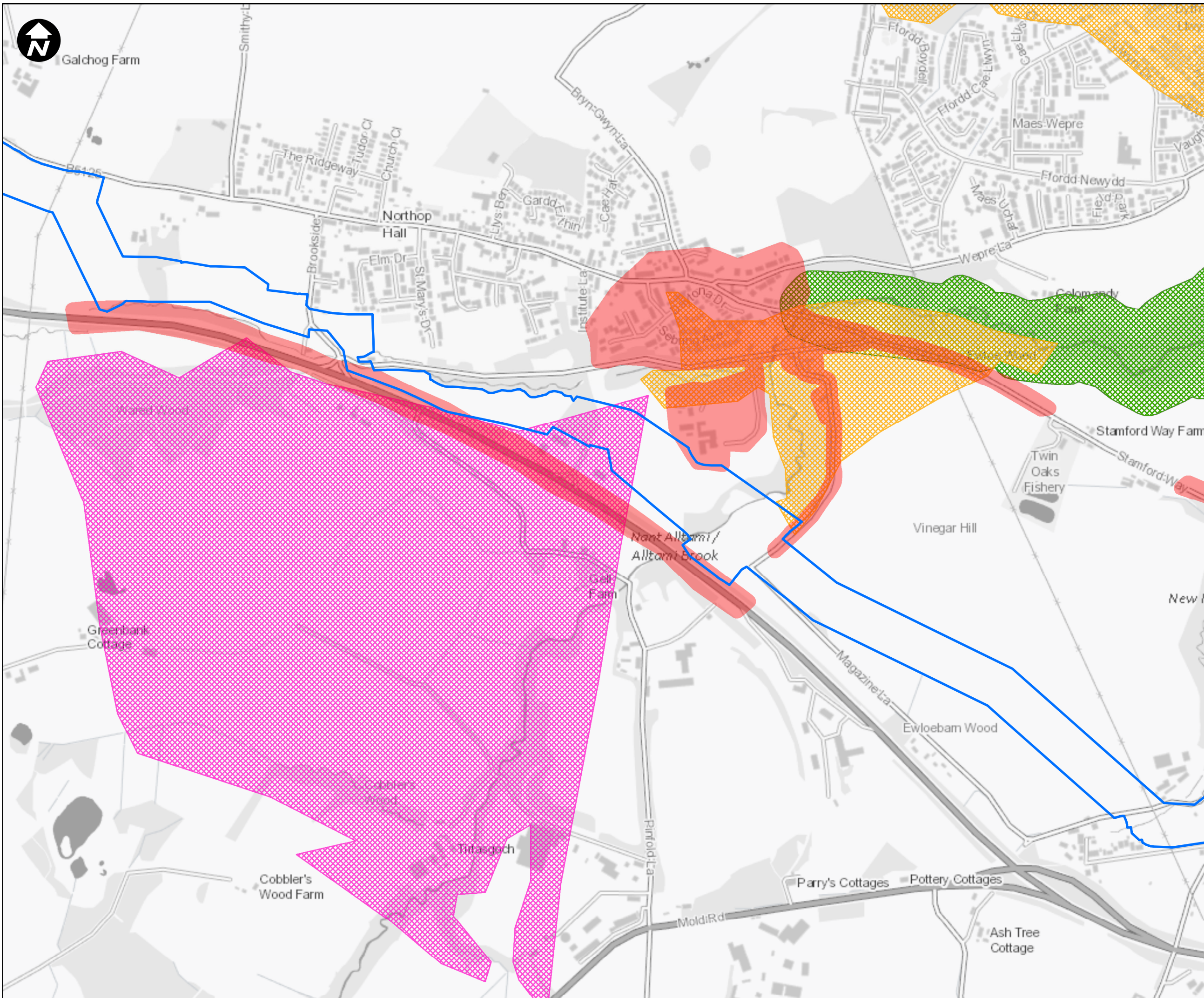
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HyNet Carbon Dioxide Pipeline DCO

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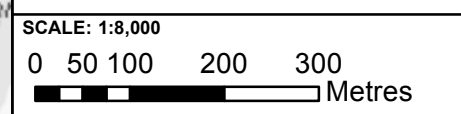
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- Key**
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 - Project Exploratory hole records
 - Permanent acquisition of subsurface
 - Sterilised areas +16.3m buffer
 - Mineral Safeguarding Areas
 - Flintshire additional Safeguarded Minerals: Brick Clay
 - SSSI + 50m Buffer
 - Section Divisions



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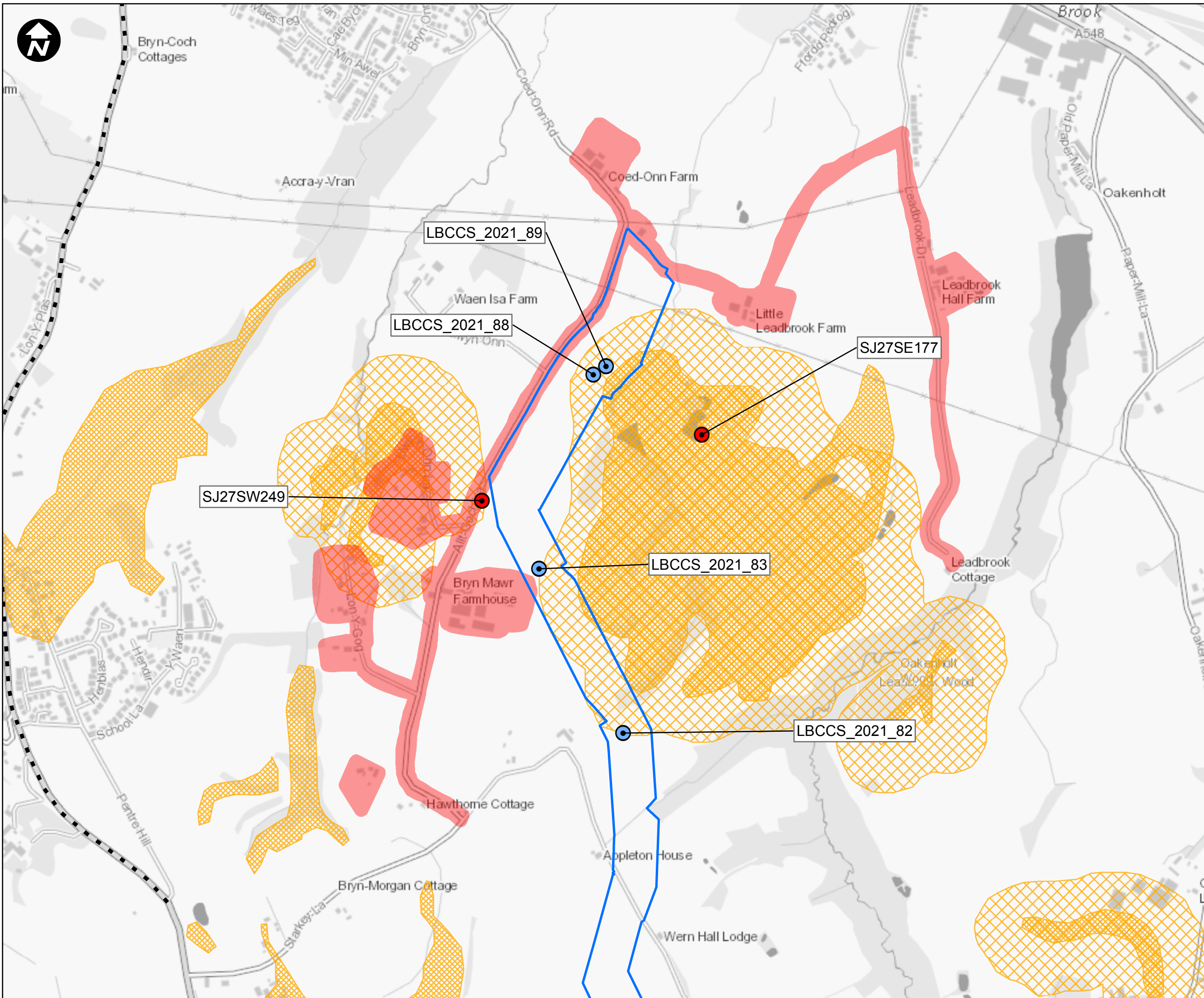
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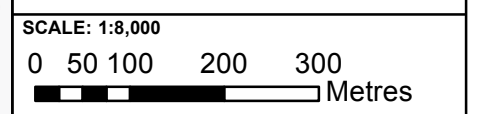
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EN070007-APP-ES-11.3.3-Sheet 7



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 - Project Exploratory hole records
 - Permanent acquisition of subsurface
 - Sterilised areas +16.3m buffer
 - Mineral Safeguarding Areas (Flintshire UDP)
 - Mineral Safeguarding Areas (Flintshire LDP)
 - Section Divisions



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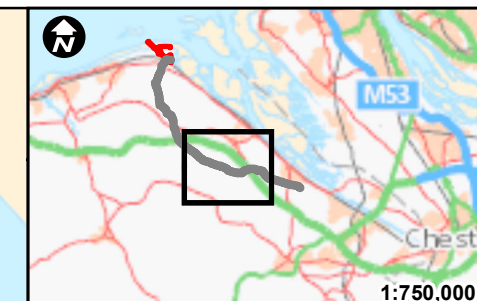
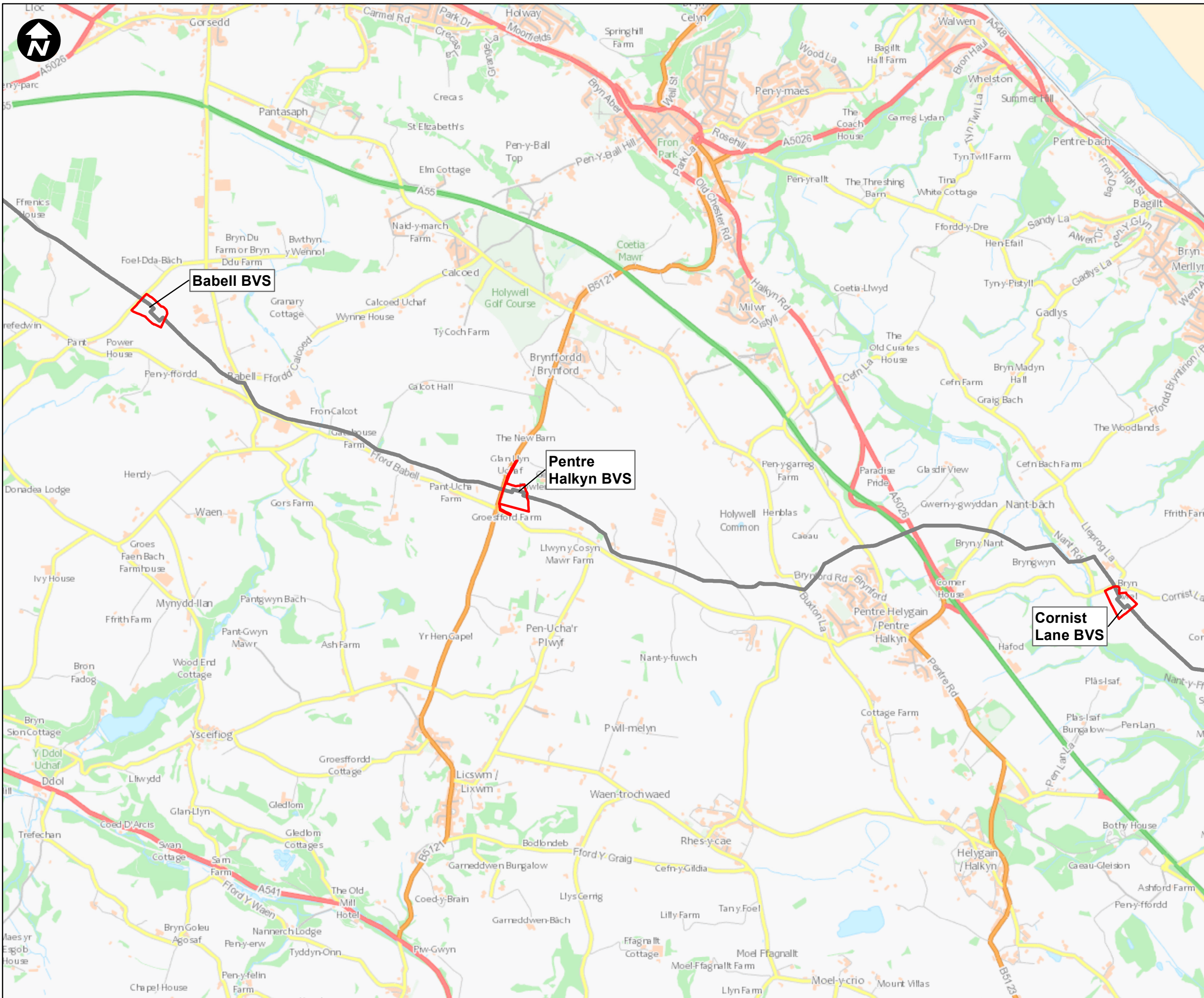
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HyNet Carbon Dioxide Pipeline DCO

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Figure 11.3.3 MSA Intersection
Sheet 8 of 8

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EN070007-APP-ES-11.3.3-Sheet 8



Key:

- Site Boundary
- Existing Flint Connection to PoA Terminal Pipeline

SCALE: 1:25,000

0 50 100 200 Metres

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PROJECT TITLE
HyNet Carbon Dioxide Pipeline DCO

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Figure 11.3.4: BVS Site Locations

DRAWING STATUS
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EN070007-APP-ES-11.3.4



Key:

- Site Boundary
- Existing Flint Connection to PoA Terminal Pipeline
- Proposed development layout



SCALE: 1:1,000

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PROJECT TITLE
HyNet Carbon Dioxide Pipeline DCO

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Figure 11.3.5 Babel BVS Site Layout Sheet 1

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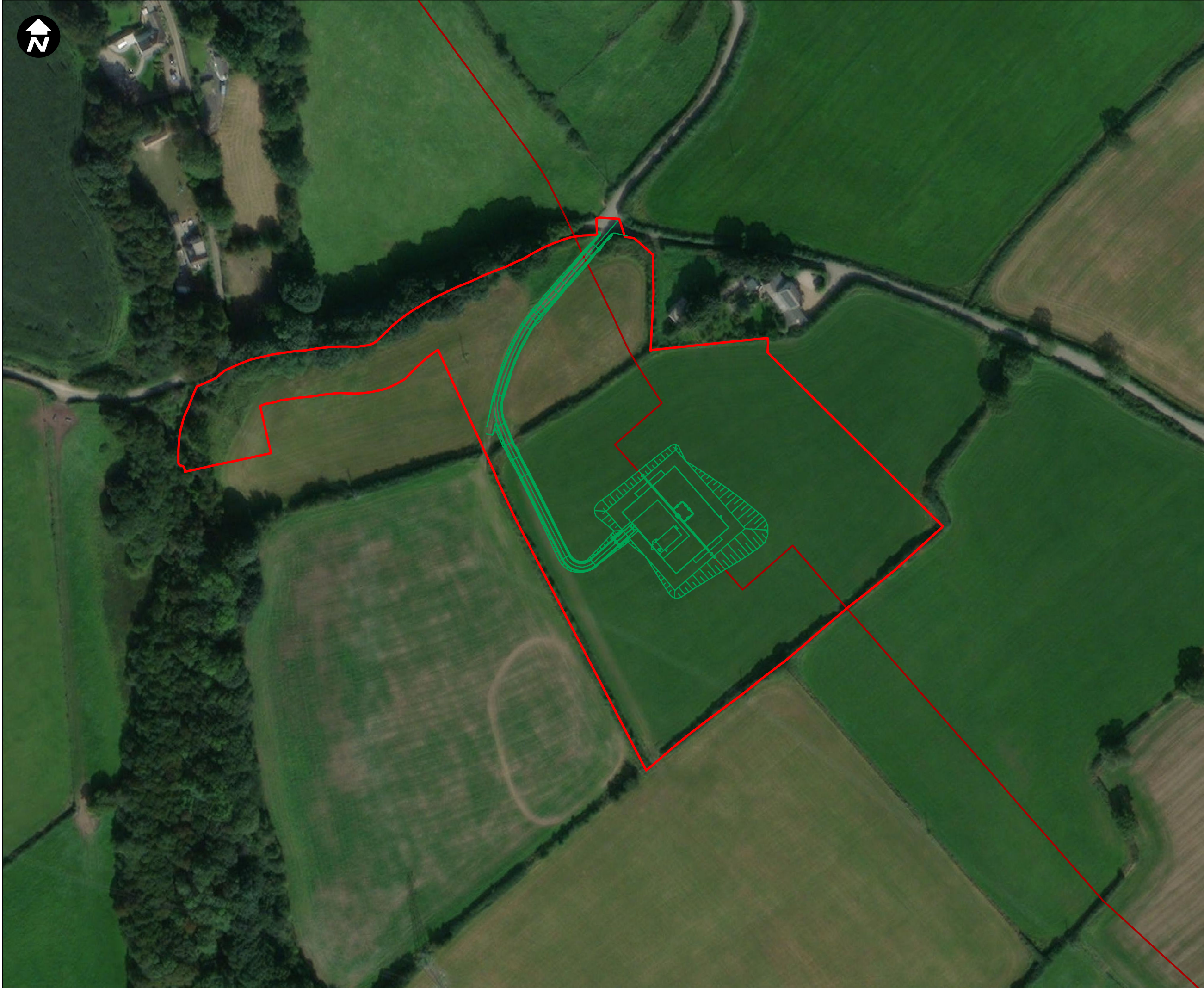
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EN070007-APP-ES-11.3.5-Sheet 1



Key:

- Site Boundary
- Existing Flint Connection to PoA Terminal Pipeline
- Proposed development layout



SCALE: 1:1,500

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PROJECT TITLE
HyNet Carbon Dioxide Pipeline DCO

DRAWING TITLE
Figure 11.3 5 Cornist Lane BVS Site Layout Sheet 2

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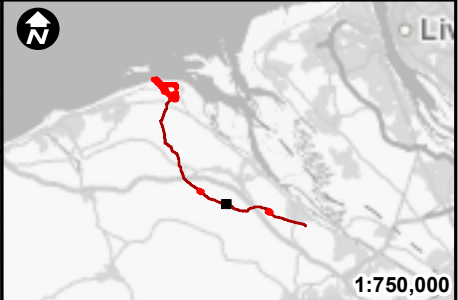
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EN070007-APP-ES-11.3.5-Sheet 2



Area of proposed tree planting

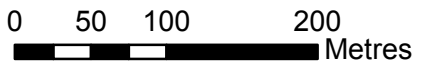
Area of proposed tree planting



Key:

- Site Boundary
- Existing Flint Connection to PoA Terminal Pipeline
- Proposed Development Layout

SCALE: 1:1,500



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HyNet Carbon Dioxide Pipeline TCPA

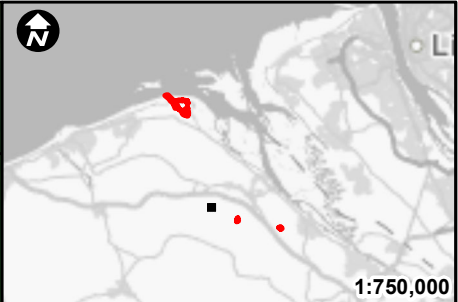
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Figure 11.3 5 Pentre Halkyn BVS Site Layout Sheet 3

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EN070007-APP-ES-11.3.5-Sheet 3



Key:

- Site Boundary
- Trial Pit Location

SCALE: 1:1,000

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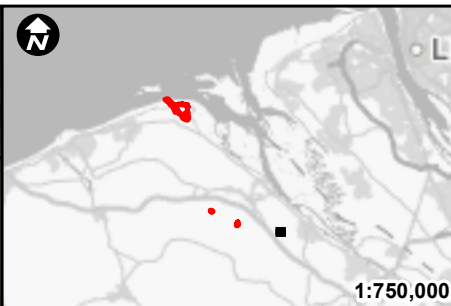
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Figure 11.3.6 Trial Pit Locations at Proposed Block Valve Station Sites

DRAWING STATUS
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EN070007-APP-ES-11.3.6-Sheet 1



Key:

- Site Boundary
- Trial Pit Location

SCALE: 1:1,500

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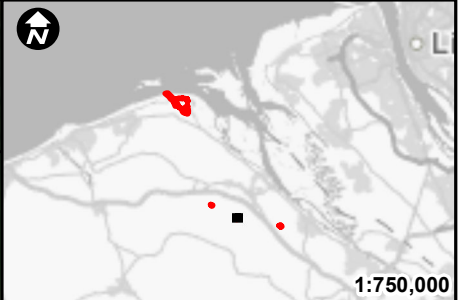
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EN070007-APP-ES-11.3.6-Sheet 2



Key:

- Site Boundary
- Trial Pit Location

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HyNet Carbon Dioxide Pipeline DCO

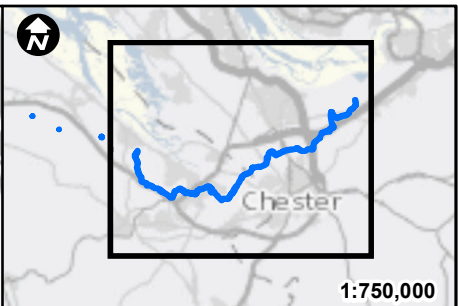
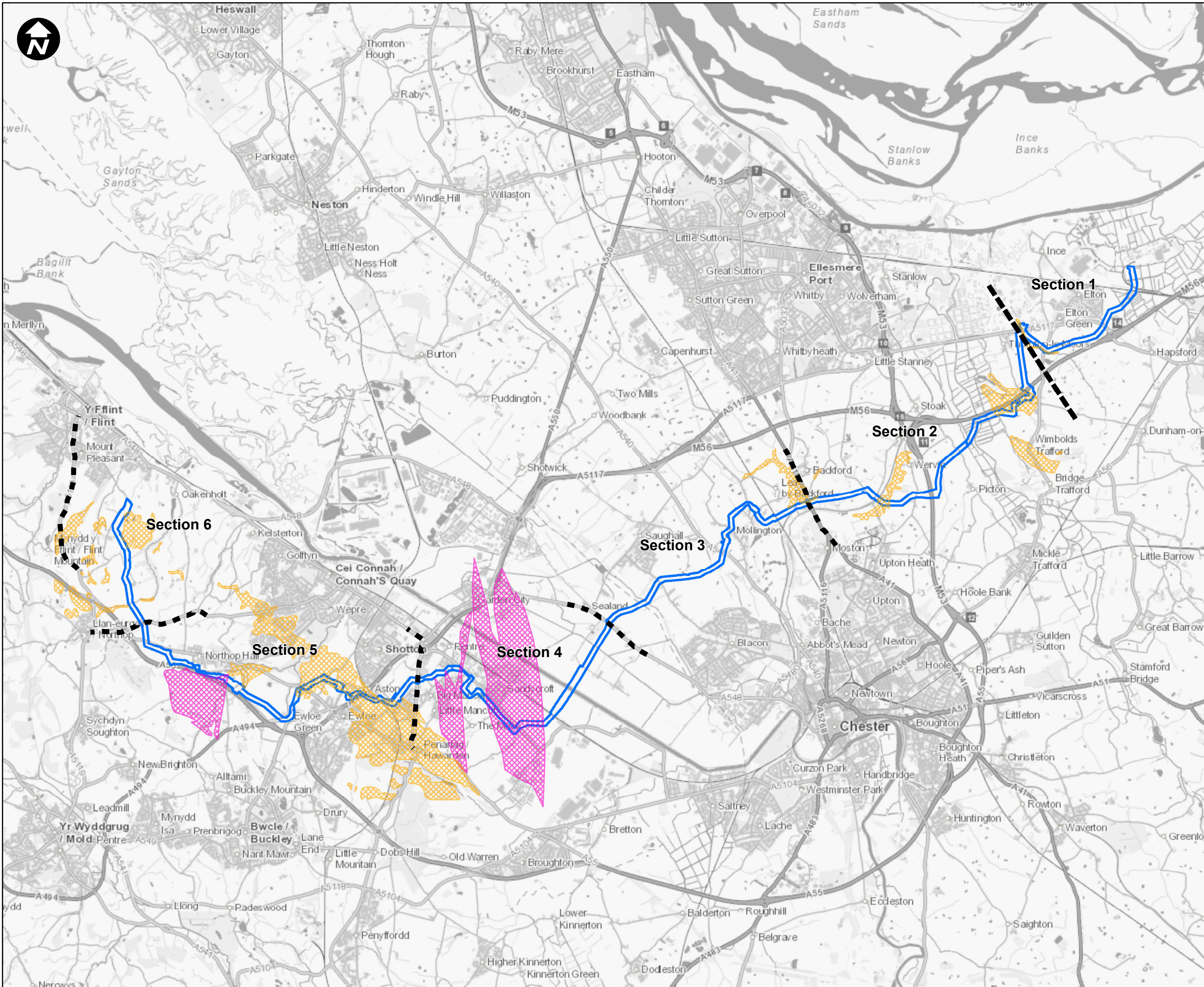
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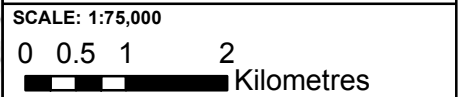
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- Key**
- ■ Section Divisions
 - ▨ Mineral Safeguarding Areas
 - ▨ Flintshire additional Safeguarded Minerals
 - ▭ Permanent acquisition of subsurface



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Figure 11.3.7 Mineral Safeguarding Areas

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Annex B

MINERALS PLANNING POLICY

12 Development Management Policies - Valuing the Environment

Applicant that it is possible to adequately control the operations taking into account the location of the proposed facility and its proximity to sensitive receptors.

EN23: Minerals Safeguarding

Non-mineral development within Mineral Safeguarding Areas as defined on the proposals map will only be permitted where it can be demonstrated that:

- a. the mineral underlying the site does not merit extraction, or
- b. the need for the non-mineral development outweighs the need to protect the resource, or
- c. the mineral can be satisfactorily extracted prior to the non-mineral development, or
- d. the development is of a temporary nature or can be removed within the timescales within which the mineral is likely to be needed, and
- e. essential infrastructure that supports the supply of minerals would not be compromised or would be provided elsewhere.

All applications for development, with the exception of householder applications, in these areas shall be supported by a Mineral Safeguarding Assessment.

Proposals for non-mineral development on sites of 4ha or more, which are underlain by Category 1 sand and gravel shall be supported by a Prior Extraction Assessment.

- 12.76** This policy expands on Strategic Policy STR16, protecting potential resources from development and accords with national planning policy contained in PPW 10 which requires Mineral Planning Authorities to safeguard access to mineral deposits which society may need in the future.
- 12.77** Flintshire is underlain by a wealth of minerals which society may need, now or in the future. Minerals are a finite resource and can only be worked where they occur whereas there is often choice regarding the location of non-mineral development. This policy safeguards undeveloped land underlain by mineral from unnecessary sterilisation. The mineral resources safeguarded include sand and gravel, limestone, and clay. PPW 10 states that the safeguarding of primary coal resources is not required. As there are no specific circumstances within Flintshire to warrant the safeguarding of coal resources, the Minerals Safeguarding Area does not safeguard coal resources. Rail heads and the Port of Mostyn are also safeguarded under this policy in accordance with PPW 10 which requires the safeguarding of mineral infrastructure and are also identified under the Mineral Safeguarding Areas on the proposals map.

Development Management Policies - Valuing the Environment 12

- 12.78** Due to the extent and distribution of mineral within Flintshire, and the need for non-mineral development such as housing, it is inevitable that some sterilisation will occur and this is accepted and established through the allocation of sites underlain by mineral in the LDP. Where mineral is confirmed as being of economic importance it will be expected that the potential for extraction of the mineral prior to the non-mineral development will be explored, this is defined as 'prior extraction'. Any loss should be minimised through prior extraction where feasible. Although the policy includes provision for prior extraction, even where prior extraction is required it is likely that there will still be some sterilisation of mineral since there will be a need to ensure that development can occur over a reasonable timescale and without prejudicing the viability of the non-mineral development.
- 12.79** The Mineral Safeguarding Assessment should contain sufficient information to enable the Local Planning Authority to establish whether the proposed development meets any of the criteria identified within the policy above. The information used to establish Mineral Safeguarding Areas was produced at a strategic level and there may be instances where mineral underlying a site does not merit safeguarding. Mineral produced as a result of prior extraction will be considered to be a windfall and need for the mineral concerned does not need to be demonstrated against regional needs.
- 12.80** The need for mineral underneath sites which are allocated for non-mineral development has already been considered through the development of the LDP and the need for the non-mineral development is considered to outweigh the need to protect the resource in its entirety. Nevertheless, prior extraction should be undertaken where possible and applications for non-mineral development should be supported by a Prior Extraction Assessment. The level of prior extraction which can be undertaken will depend upon the nature of mineral concerned, the size of the site, the phasing, timing, design and delivery of the non-mineral development. The sites which are considered to offer the greatest potential for prior extraction are those which are at least 4ha in size and applications on these sites should be supported by a Prior Extraction Assessment. Prior extraction on smaller sites is considered much less likely to be feasible or desirable. Nevertheless, an advisory will be included on any pre-application advice issued in respect of such sites confirming the likelihood of the site being underlain by mineral of economic importance and the potential benefits of prior extraction.

12 Development Management Policies - Valuing the Environment

EN24: Minerals Buffer Zones

Development in the minerals buffer zones as identified on the Proposals Map will only be permitted where it can be demonstrated that it would not compromise current or planned mineral extraction.

Applications for mineral extraction within buffer zones will only be permitted where it can be demonstrated that a sufficient buffer between mineral extraction and sensitive development can be maintained.

- 12.81** This policy expands on Policy STR16 and aims to protect existing mineral reserves from development which would conflict with its extraction, and to reduce the impact of quarrying on sensitive land uses.
- 12.82** Flintshire has a number of operational quarries, including hard rock quarries which utilise blasting to extract the material. The impact of quarrying will vary from site to site and the impact of blasting will depend upon the precise location of a blast and on blast design. Minerals Technical Advice Note 1 advises minimum distances of 100m for sand and gravel and 200m for hard rock. However, where sensitive development has already encroached closer to quarry workings it is not possible to retain this distance. Nevertheless, where it is possible to secure a 100m or 200m buffer, depending on the mineral type, it has been applied. Proposals for sensitive development within buffer zones will generally not be supported since the developer of the non-mineral development is unlikely to be able to control the mineral workings in any way and therefore ensure that there would be no adverse impact from quarrying operations. Exceptions to this include infill development, householder development or development on the far side of a built up area which already encroaches into a buffer zone. Proposals for less sensitive development, such as employment uses, may be acceptable and would be considered on a case by case basis.
- 12.83** Buffer zones have been applied around operational quarries and those quarries which have an extant planning permission but may not be currently working. Buffer zones have also been applied to the proposed allocations of new mineral workings. The Minerals Background Paper provides details of the approach which has been taken with respect to the different mineral sites.

Development Management Policies - Valuing the Environment 12

Site Name	Mineral Type	Buffer	Comments
Aberdo/Bryn Mawr	Limestone/Chertstone	200m	Active
Cefn Mawr	Limestone	200m	Active
Grange	Limestone	200m	The site has not worked since the 1970's and the owner has shown no intention of working the site. Although the site is a candidate for prohibition a buffer shall be retained until such time as an Order is confirmed.
Hendre	Limestone	200m	Active
Hendre Quarry Extension	Limestone	200m	Proposed Allocation – extension to existing quarry
Pant	Limestone	200m	Mineral has not been extracted at the site for a number of years. Stability issues have been cited. Although the site is a candidate for prohibition a buffer shall be retained until such time as an Order is confirmed.
Pant y Pwll Dŵr	Limestone	200m	Active
Pant y Pwll Dŵr extension	Limestone	200m	Proposed Allocation – extension to existing quarry
Pen yr Henblas, Pen-y-Garreg and Bryn Blewog	Limestone	200m	The sites have not worked since 1996. Although the site is a candidate for prohibition a buffer shall be retained until such time as an Order is confirmed.
Liverpool Road/Catheralls	Clay/Shale	100m	The site is inactive and is the subject of a stalled ROMP which is linked with Parry's Quarry. The site has been put forwards for inclusion in the LDP for housing. Although the site is a candidate for prohibition a buffer shall be retained until such time as an Order is confirmed.
Pinfold Lane	Clay/Shale	100m	The operator did not comply with a request for further information in respect of the ROMP application and is now considered to have lapsed. Although the site is a candidate for

12 Development Management Policies - Valuing the Environment

			prohibition a buffer shall be retained until such time as an Order is confirmed.
Stoney Beach	Clay/Shale	100m	Planning permission has been granted for a waste facility at the quarry which is subject to a S106 which prevents mineral extraction. Although the site is being developed for an alternative use a buffer shall be retained until such time as the planning permission is implemented.
Ruby	Shale	100m	The site has not been worked for a number of years and has naturally regenerated. Although the site is a candidate for prohibition a buffer shall be retained until such time as an Order is confirmed.
Ddol Uchaf	Sand and Gravel	100m	The site is dormant but the operator has indicated that they intend to work the site in the near future.
Ddol Uchaf extension	Sand and Gravel	100m	Proposed Allocation – extension to existing quarry
Fron Haul	Sand and Gravel	100m	Active
Sandy Lane Farm, Kinnerton	Sand and Gravel	100m	Active
Maes Mynan	Sand and Gravel	100m	Active

Development Management Policies - Valuing the Environment 12

EN25: Sustainable Minerals Development

To contribute towards the sustainable supply of minerals the following extensions to existing quarry sites are allocated, as defined on the proposals map:

- EN25.1 Extension to Hendre Quarry (Limestone)
- EN25.2 Extension to Pant y Pwll Dwr Quarry (Limestone)
- EN25.3 Extension to Ddol Uchaf Quarry (Sand and Gravel)
- EN25.4 Extension within Fron Haul Quarry (Sand and Gravel)

12.84 The North Wales Regional Technical Statement (RTS) 1st Review has identified a requirement for Flintshire to allocate at least 1.4 million tonnes of sand and gravel and at least 3.84 million tonnes of crushed rock. The allocations identified in Policy EN25 are sufficient to meet the identified need over the Plan Period. In relation to crushed rock, the allocations could each, in isolation, meet the requirement identified in the RTS. The decision to allocate both sites has been made in recognition of the economic importance of these sites to Flintshire and the region and to help support their viability over the longer term. In both cases, the mineral would be extracted over a period beyond the LDP and would release mineral which, although currently consented, is currently unavailable due to the practicalities of removing it.

12.85 Fron Haul is an operational sand and gravel quarry with existing permitted reserves. The allocation would enable reserves to be removed which are currently within the site boundary but which are not currently consented. Ddol Uchaf is a dormant site which has not been worked for a number of years. The allocation includes an area to the west which is not currently consented but which would, together with the consented area, form one large quarry. The site is to the north of the AONB and has the potential to impact the AONB. Progressive restoration will therefore be important to minimise any impacts on the setting of the AONB.

Site	Mineral	Area	Tonnage	Comments
Extension to Hendre Quarry	Limestone	8ha.	11 million tonnes	The operator advises that an additional 11 million tonnes could be provided by the proposed extension, comprising 10 million tonnes loggerheads limestone and 1 million tonnes Cefn Mawr limestone (which is typically a poorer quality limestone with a higher level of impurities). It's likely that some form of application would need to come forwards prior to the adoption of the LDP to ensure that mineral extraction can continue on the site uninterrupted.

12 Development Management Policies - Valuing the Environment

Extension to Pant Y Pwll Dŵr Quarry	Limestone	14ha.	13 million tonnes	Proposed extension of 16.6ha of which 8.8ha would be subject to mineral extraction supplying up to 13 million tonnes of limestone. Proposed extension is within area already consented either by the mineral permission or the overburden storage mound. Annual output limit of 1.2 million tonnes which it is understood would not change as a result of the proposed extension.
Extension to Ddol Uchaf Quarry	Sand and Gravel	9.95ha.	1.4 million tonnes	Site originally put forward by operator was too close to residential properties. The gradient of the site was too steep to allow extraction to its northern extent. Boundary of the proposed allocation was changed to account for this.
Extension within Fron Haul Quarry	Sand and Gravel	3.2ha.	900,000 tonnes	Proposed extension within the existing footprint of the consented Fron Haul underneath plant/buildings.

Development Management Policies - Valuing the Environment 12

EN26: Criteria for Minerals Development

Proposals for mineral extraction will be permitted on allocated sites subject to meeting other Plan Policies and:

- i. There would be no significant adverse visual impact from the development that could not be satisfactorily mitigated through landscaping during the development and following the completion of the development; and
- ii. Satisfactory provision can be made for the management of any mineral wastes which would be generated by the proposal; and
- iii. Where blasting is proposed, vibration would be within acceptable limits as defined by MTAN 1 at nearby sensitive receptors; and
- iv. Satisfactory provision is made for progressive restoration; and
- v. A satisfactory after-use is identified for the site.

Proposals for mineral extraction outside allocated sites will be supported, outside of the AONB, where there is a demonstrable need for the mineral concerned and where allocated sites are not available to meet that need, subject to meeting the criteria identified above and where a satisfactory buffer between mineral extraction and sensitive development can be achieved.

- 12.86** There are other minerals within the County which could be exploited such as clay and sandstone. Although there is currently no pressure or need to work these minerals, Policy EN26 is sufficiently flexible to enable a site to come forward, subject to meeting the criteria identified above. Proposals for borrow pits will also be considered against national policy and the criteria above.
- 12.87** Whilst there are coal deposits within the County, PPW 10 states that proposals for opencast, deep-mine or colliery spoil disposal should not be permitted, except in wholly exceptional circumstances where there is a demonstrable need in the context of climate change emissions reduction targets and for reasons of national energy security.
- 12.88** However, the Welsh Government has set challenging targets for decarbonisation and increased renewable energy generation. Therefore the continued extraction of all fossil fuels, including coal, shale gas and coal bed methane and underground coal gasification, are not compatible with those targets. The Welsh Government's Policy objective is therefore to avoid the continued extraction and consumption of fossil fuels. Should proposals be submitted to the Local Planning Authority for the extraction of on-shore oil and gas, robust and credible evidence will need to be provided to the effect that the proposals conform to the energy hierarchy.
- 12.89** Sites which are dormant or inactive will be kept under review and prohibition orders issued where deemed necessary.

12 Development Management Policies - Valuing the Environment

EN27: Secondary and Recycled Aggregate

Proposals for the management of secondary and recycled aggregates will be supported outside settlement boundaries provided they meet the following criteria:

- i. they are temporary and would enable wastes arising from an identified development site/s to be managed in a sustainable way,
- ii. they would not have an adverse impact on residential amenity through noise or dust,
- iii. the development would not result in the loss of permanent features such as trees and hedgerows, and
- iv. the site can be satisfactorily restored to its original condition following the cessation of the use.

- 12.90** The need to minimise the production of waste and to encourage the reuse of materials is recognised in national policy and promoted through the LDP. Because of the nature of development sites there may be a short term, temporary requirement for space to manage demolition and construction wastes and this should be considered and planned for at an early stage. In some cases, the management of construction and demolition wastes arising from a development could constitute permitted development. Where planning permission is required, land may only be required for a temporary period of time and could be supported outside development boundaries where there are identifiable benefits relating to a particular development. Permanent facilities should be directed towards sites which are allocated for waste uses, in line with policy EN21.



Flintshire County Council

Flintshire County Council Unitary Development Plan 2000-2015 Adopted 28th September 2011

[Back to Contents](#) | [Back to Introduction](#)

Chapter 18

Minerals

Relevant Strategic Aims	
h. Resources	
Policy Objectives	Policy List
<p>a. supporting the economy - to enable the sustainable extraction of mineral resources to meet the needs of the local, regional and national economy</p> <p>b. impact of extraction - to protect sensitive areas from inappropriate minerals development and to mitigate the impact of minerals development on the environment</p> <p>c. safeguarding resources - to protect mineral resources from sterilisation and to ensure the appropriate use of minerals</p> <p>d. restoration - to ensure sites used for minerals purposes are restored to the highest possible standards</p>	<p>MIN1 Guiding Minerals Development</p> <p>MIN2 Minerals Development</p> <p>MIN3 Controlling Minerals Operations</p> <p>MIN4 Restoration and Aftercare</p> <p>MIN5 Dormant, Inactive and Interim Development Order Sites</p> <p>MIN6 Review of Mineral Permissions</p> <p>MIN7 Exploration for Minerals</p> <p>MIN8 Protection of Mineral Interests</p> <p>MIN9 Borrow Pits</p> <p>MIN10 Mineral Buffer Zones</p>
Indicators of Policy Performance	Targets
93. <i>Status of minerals land banks and extraction of permitted reserves</i>	

18 Minerals

Introduction

- 18.1 Minerals as a resource are important elements of the development plan, and the sustainable development debate. To develop a sustainable economy and lifestyle, sustainable development requires that resources are used prudently. Whilst the development plan cannot, in itself, meet all the challenges which this debate presents, it can seek to influence patterns of land use, and by limiting the detrimental impacts of new development on the wider environment it can help to ensure that the people of Flintshire enjoy a safe and healthy quality of life.
- 18.2 Minerals are important national resources and their exploitation makes an essential contribution to the nation's prosperity. Whilst the extraction of minerals can be environmentally disruptive, they can only be worked where they are found. Minerals extraction presents significant challenges to planning authorities, which seek to promote economic development while maintaining the quality of the local environment.

Policies within the development plan aim to strike a balance between all of these needs seeking to mitigate the impacts of minerals development and to prevent development in those sensitive locations where mineral extraction and associated activities would have an unacceptable impact.

National Planning Policy

- 18.3 Minerals Planning Policy (Wales) produced in December 2000 together with the Aggregates TAN (2004) sets the policy framework for all minerals policies contained within Welsh Unitary Development Plans. As such, when determining applications for minerals development it will be important to consider the national policies in association with the development plan.
- 18.4 Specifically MPPW requires that:
- UDP's should be reviewed every five years to undertake assessments:
 - i. Of minerals resources within the authority area and of reserves with planning permission;
 - ii. Of local, regional, and national distribution and production of each mineral and its significance within the authority area;
 - That UDP's should relate policies and proposals to identifiable areas of land;
 - That UDP's include policies which provide a policy guidance for minerals worked within the authority area.
- 18.5 Minerals Planning Policy (Wales) emphasises the role of the Minerals Planning Authority should be to ".....ensure the proper balance is struck between that fundamental requirement, the need to ensure a prudent use of finite resources, and the protection of existing amenity and the environment. Any effect on local communities and the environment must be minimised and therefore ameliorated to an acceptable standard. In certain areas, mineral extraction may not be acceptable". The five key principles of MPPW are as follows:
1. Provide mineral resources to meet society's needs and to safeguard resources from sterilisation.
 2. Protect areas of importance to natural or built heritage.
 3. Limit the environmental impact of mineral extraction.
 4. Achieve high standard restoration and beneficial after-use.
 5. Encourage efficient and appropriate use of minerals and the re-use and recycling of suitable materials.
- 18.6 The North Wales Regional Aggregates Working Party Annual Report in 2003 indicated the supply and demand of aggregates for the construction industry. On the basis of previous estimates of mineral demand and rates of extraction it is considered that North Wales benefits from a significant reserve of aggregate and sand and gravel reserves. Indeed North East Wales (including Flintshire) benefits from a landbank of 33 years for limestone and 14 years for sand and gravel (at 2003 base date). It is evident that the mineral reserves in North Wales are extensive and are very likely to meet future mineral demands beyond the life of the Unitary Development Plan especially when considering new mineral permissions in neighbouring authorities.
- 18.7 It is considered that the landbank for the region and the sub-region is sufficient to meet future need. As such the Flintshire UDP does not identify the need for new minerals extraction within the Plan period and neither does it propose to make allocations for any new minerals extraction. Any future proposals for minerals extraction will be determined against the Plan's policies and, when available, the Regional Technical Statement, which will provide a steer for the region in meeting future mineral needs without compromising environmental assets such as the Clwydian Range Area of Outstanding Natural Beauty and the environmental capacity of the County.

Policies

MIN1 Guiding Minerals Development

Proposals for the winning, working, processing and/or recovery of minerals will be assessed against the need for new mineral workings and the ability of existing sites to meet demand. Preference will be given to the use of secondary and recycled materials and mineral waste.

Where there is a clear and demonstrable need for primary materials, preference will be given to:

- a. the deepening of existing mineral workings; and