QTS Project Wind

Environmental Setting and Site Design Report – Phase B & C

QTS Data Centres

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1.0

Introduction

1.0 Introduction

1.1 The Site

QTS Data Centres (QTS, the Client) is proposing to construct a new data centre campus (Cambois Campus) on the site of the former coal-stock yards which serviced Blyth Power Station until the early 1990s. The Cambois Campus site consists of a parcel of land which is approximately 102 ha in size and is located 3km north of Blyth town centre in Cambois, Northumberland. The approximate centre of the site is National Grid Reference (NGR) NZ 29820 84164.

This report will relate to the area of the site as shown in red in the Figure below – 'The Site'. The wider site boundary (for the Cambois Campus) covered in outlined planning is presented in blue (Figure 1-1).



Figure 1-1: Site Layout

1.2 The Scheme

Further development of the Cambois Campus site will continue following completion of a phase of enabling works (Phase B & C, to be undertaken in stages across the site). Phase A enabling works are nearing completion at the time of writing this report (and constitutes the majority of the areas within the wider boundary not included within the red line boundary in Figure 1-1).

It is currently proposed to undertake earthworks within the Phase B & C Enabling Works boundary (the Site) to establish finished enabling levels, which will facilitate the construction of the proposed data centre campus. The permanent elements of the scheme within Phase B & C includes eight data centre buildings (DC03 through to DC10), a substation,

associated below-ground infrastructure, landscaping and external pavements and roads. Although full detail of the drainage system is not yet designed, surface water will be collected from buildings and hardstanding and discharged into the Cow Gut / Maw Burn via appropriate SuDS treatment as outlined in the Drainage Strategy. Foul water will be discharged to a public sewer network.

Earthworks will involve the excavation and potential reuse of materials across the site, including burnt shale materials identified as a component of the onsite Made Ground during the preceding ground investigations. Discussions with the Environment Agency (EA) have confirmed that reuse of burnt shale material will be under a Deposit for Recovery Permit.

1.3 Objectives

Cundall was commissioned by the Client to prepare an Environmental Setting and Site Design (ESSD) Report to support an environmental permit application for a deposit for recovery permit for the burnt shale material (also known as Red Shale) present on the Site. “Recovery of waste” is defined as any operation the principal result of which, is waste serving a useful purpose by replacing other materials which would otherwise have been used to fulfil a particular function. This report aims to provide environmental context of the Site to demonstrate that the reuse of the burnt shale will not result in unacceptable risks to Controlled Waters, following methodology laid out by the Environment Agency (Landfill operators: environmental permits - What to include in your environmental setting and site design report - Guidance - GOV.UK).

It should be noted that the reuse of burnt shale under an Environmental Permit is at the request of the Environment Agency in pre-application correspondence. There have been no exceptional risks from burnt shale materials identified in previous assessments undertaken on the site.

Other materials proposed for reuse on site are considered to be low risk and are to be reused under the Definition of Waste Code of Practice (DoW COP) managed by CL:AIRE. A Materials Management Plan is to be completed and declared by the Contractor, materials moved under the MMP are not considered within this report, other than to provide context.

1.4 Sources of Information

The following sources of information have been used in the preparation of this report, including references therein. Of the list below, documents in **bold** have been provided as a supporting information pack for the Environmental Permit.

1. Environment Agency, Estuary detail [accessed September 2026].
2. **Cundall (14 August 2026) Waste Recovery Plan – Phase B & C. Document Ref GBR1-ENA2-CDL-STE-XX-RP-B-0012**
3. Arcadis (3 July 2026) Enabling Works Phase B & C Landscape Specification. Report reference GBR1-ENA2-ARC-STE-XX-SP-L-0002 V01
4. **Cundall (3 July 2026) Earthworks Strategy. Report reference GBR1-ENA2-CDL-STE-XX-RP-B-1005 V01**
5. Cundall (3 July 2026) Enabling Works Phase B & C – Below Ground Features Plan. Drawing reference GBR1-ENA2-CDL-STE-XX-DR-B-1009
6. Cundall (3 July 2026) Enabling Works Phase B & C Surface Cover Materials. Drawing reference GBR1-ENA2-CDL-STE-XX-DR-B-1002
7. Cundall (3 July 2026) Enabling Works Phase B & C Existing Mound Removal. Drawing reference GBR1-ENA2-CDL-STE-XX-DR-C-1302 V-01
8. Cundall (3 July) Enabling Works Phase B & C Proposed Enabled Ground Level. Drawing reference GBR1-RMAPB-CDL-STE-XX-DR-C-1301
9. Cundall (3 July 2026) Enabling Works Phase B & C Existing Levels. Drawing reference GBR1-RMAPB-CDL-STE-XX-DR-C-1103
10. Cundall (3 July 2026) Ground Conditions Summary Report. Report reference GBR1-ENA2-CDL-STE-XX-RP-B-1003 V01
11. Cundall (29 May 2026) Culvert Mitigation Options. Report reference GBR1-DCZZ-CDL-STE-XX-RP-B-0019 P01

12. Cundall (8 May 2026) Enabling Works Phase B Existing Levels. Drawing reference GBR1-RAMPB-CDL-STE-XX-DR-C-1003 P02
13. Cundall (8th May 2026) Enabling Works Phase B Finished Ground Level. Drawing reference GBR1-RMAPB-CDL-STE-XX-DR-C-1008
14. Cundall (8th May 2026) Enabling Works Phase B Drainage Layout. Drawing reference GBR1-RMAPB-CDL-STE-XX-DR-C-1011
15. **Cundall (8 May 2026) Enabling Works – Phase B Drainage Layout. Drawing reference GBR1-RMAPB-CDL-STE-XX-DR-C-01-11 P02.**
16. **Cundall (8 May 2026) Addendum to Drainage Strategy – Enabling Works Phases A, B & C. Report reference NCL1-ENA1-STE-UG-RP-C-00-02 P04**
17. Cundall (8 October 2025) Maw Burn and Cow Gut Dye Tests. Report reference NCL1-DCZZ-STE-UG-RP-C-00-06
18. Cundall (3 October 2025) Proposed Site Layout. Drawing reference GBR1-DCZZ-CDL-STE-XX-DR-C-1201 V02
19. Cundall (3 October 2025) Existing Watercourse Diversion – Maw Burn. Drawing Reference GBR1 DCZZ CDL STE XX DR C 1105 V02
20. Cundall (3 October 2025) Existing Watercourse Diversion – Cow Gut. Drawing Reference GBR1 DCZZ CDL STE XX DR C 1105 V02
21. Cundall (3 October 2025) Phase 1 Geotechnical Design Report. Report reference GBR1-DCZZ-CDL-STE-XX-RP-B-0-0014 V02
22. Cundall (1 October 2025) Pre-Enabling Works Water Sampling Report. Report Reference GBR1-DCZZ-CDL-STE-XX-RP-B-0017 P01
23. Cundall (29 August 2025) Geological Cross Sections. Drawing reference GBR1-DCZZ-CDL-STE-XX-DR-B-0013 V01
24. Cundall (14 August 2025) Detailed Remediation Strategy. Report Reference GBR1-RMAP1-CDL STE-XX-RP-0003
25. Cundall (1 August 2025) Enabling Works – Phase A Drainage Layout. Drawing reference GBR1-ENA1-STE-XX-DR-C-01-33.
26. Cundall (6 June 2025) Proposed Finished Levels. Drawing reference GBR1-DCZZ-CDL-STE-XX-DR-C-1010 V02
27. Cundall (23 May 2025) Remediation and Earthworks Strategy. Report reference GBR1-DCZZ-XXX-UG-RP-B-00-11
28. Cundall (23 May 2025) Ground Gas Assessment. Report Reference GBR1-DCZZ-XXX-UG-RP-B-00-08 V03
29. Arcadis (January 2025). Cambois Data Centre Campus Ground Investigation Report. Report reference: 30226657-AUK-XX-XX-RP-ZZ-0017-01 Rev 01.
30. Arcadis (January 2025) Ground Investigation Factual Report – Stage 1 Project Wind, Blyth. Report reference: 30226657-AUK-XX-XX-RP-ZZ-0015-01 Rev 03.
31. Arcadis (January 2025) Ground Investigation Factual Report – Stage 2 Project Wind, Blyth. Report reference: 30226657-AUK-XX-XX-RP-ZZ-0015-01 Rev 03.
32. Cundall (22 November 2024) Proposed Drainage Strategy. Report Reference NCL1-DCZZ-STE-UG-RP-C-00-01.
33. Arcadis (November 2024). Observed Stockpile Location Plan (>1000m^3). Reference: 30226657.
34. Arcadis (November 2024) Cambois Data Centre Campus - Phase 2 Geoenvironmental Assessment. Report reference: 30226657-AUK-XX-XX-RP-ZZ-00112-01 Rev 01
35. Arcadis (October 2024). Phase 1B Geoenvironmental Desk Study – Project Wind, Blyth. Report reference: 30226657-AUK-XX-XX-RP-ZZ-0006-01 Rev 01.
36. 1st Horizon (21 October 2024) Blyth Topographic and Utility Survey. DWG reference A-B11243
37. Rolton Group Limited (4th April 2024). Gas and Groundwater Monitoring Summary Report – Project Wind. Report reference: 210114-RGL-XX-XX-RP-G-0002 Rev S2-P01.
38. Rolton Group Limited (11th August 2022). Burnt Shale Trial Pit Investigations for Former Coal Stocking Yards, Cambois. Report reference: PHX-RGL-XX-XX-RP-G-000014A Rev S2-P03.

39. Rolton Group Limited (1st April 2022). Phase 1 & Preliminary Geo-Environmental Summary for Rail Head Land, Cambois. Report reference: PHX-RGL-XX-XX-RP-G-000014 Rev S2-P02.
40. Rolton Group Limited (14th May 2021). Geotechnical and Geo-Environmental Report for Former Coal Stocking Yards, Cambois. Report reference: PHX-RGL-XX-XX-RP-G-000010 Rev S2-P01.
41. Rolton Group Limited (7th April 2021). Phase 1 Geo-environmental Desk Study for Former Coal Stocking Yards, Cambois. Report reference: PHX-RGL-XX-XX-RP-G-000005 Rev S2-P05.
42. Rolton Group Limited (18th February 2021). Coal Mining Risk Assessment for Former Coal Stocking Yards, Cambois. Report reference: PHX-RGL-XX-XX-RP-G-000008 Rev S2-P04.
43. British Geological Survey (1990). Sheet NZ 28 SE. 1:10,560 Scale Solid and Drift Geology Map.
44. British Geological Survey (1990). Sheet NZ 38 SW. 1:10,560 Scale Solid and Drift Geology Map.
45. British Geological Survey (1975). Sheet 15 – Tynemouth. 1:63,650/1:50,000 Scale Solid Geology Map.
46. British Geological Survey (1975). Sheet 15 – Tynemouth. 1:63,650/1:50,000 Scale Drift Geology Map.

1.5 Limitations

The findings and opinions conveyed in this report are based on development proposals obtained from the client and the sources detailed within Section 1.4, which Cundall believes are reliable. The information contained in this report is to the best of our knowledge accurate at the date of issue. If new information becomes known pertaining to the site, Cundall reserves the right to review the information and revise the report. Should the standards, legislation, guidance, and best practice used in the production of this report be amended, updated, or withdrawn then the findings and recommendations of this report may be affected.

Whilst every effort has been made to interpret the conditions between investigation locations, such information is only indicative, and liability cannot be accepted for its accuracy. There may be exceptional ground conditions elsewhere on the site which have not been recorded by previous ground investigation, and which have therefore not been considered.

2.0

Site Setting and History

2.0 Site Setting and History

2.1 Site Details

The geological and geoenvironmental setting of the Site extents have been determined based on the information contained within the references listed in Section 1.4 of this report. Where reference is made to other information sources, the source used is stated in the text.

Site Area and Shape	The Site is irregular in shape and occupies an area of 58 ha.
Site Boundaries and Adjacent Land Use	▪ **North:** The northern boundary is formed by the historic Cambois Branch railway line which trends from west-east along the northern boundary. The River Wansbeck Estuary is situated around 1km north of the site with land in between mostly undeveloped. ▪ **South:** The southern boundary extends partially through the wider site (as shown Figure 1-1), where Phase A enabling works are nearing completion for the development of datacentre buildings DC01 & DC02, a substation and drainage pond. The River Blyth estuary is situated approximately 300m south of the wider site boundary. The JDR cable manufacturing facility and the National Grid Blyth substation occupies the land separating the site from the River Blyth. ▪ **East:** The eastern boundary extends partially through the wider site (as shown on Figure 1-1). SSE Renewables (SSER) shall be installing infrastructure as part of the Berwick Bank interconnector works in the area between Phase B & C and the wider south eastern boundary in the near future. Beyond the eastern site ownership boundary, land is occupied by developments associated with Cambois town including residential and commercial developments along with Cambois Primary School. Beyond this is the North Sea. ▪ **West:** The western boundary extends partially through the wider site (as shown on Figure 1-1), where Phase A enabling works are nearing completion. Beyond the ownership boundary, land to the west is occupied by industrial development in the north, mature trees and undeveloped land in the south with the North Sea Link UK Converter Station beyond the southwest boundary. The A189 is situated approximately 500m west of the site.
Existing Land Uses and Features	The area within the Phase B & C boundary is currently disused. The site features areas of asphalt and concrete hardstanding, informal roads (consisting of asphalt and gravel surfacing) associated with its former use as a coal stockyard or recent enabling works and rough grassland with areas of standing water. Around one third of the Phase B & C boundary area is occupied by two large stockpiles (both orientated north-south) comprising pulverised fuel ash (PFA), with anticipated thickness of 9m and 17m, respectively. Parts of the mounds are heavily vegetated with semi mature and mature trees. PFA mounds are proposed for reuse under the Waste Resources Action Plan (WRAP) Quality Protocol and have been confirmed by the Environment Agency not to require an additional environmental permit in this scenario. A network of concrete lined drainage channels (approximately 1m deep) are present around the hardstanding surfaces. Two named watercourses are present on site: Cow Gut and Maw Burn (more details under Hydrology, below). Overhead power cables are present along the west edge of the north part of the Phase B & C boundary, trending roughly north to south. Historical below ground features associated with the former site use have been recorded within previous ground investigation reports, surveys, site walkovers and during the ongoing Phase A Enabling Works and are summarised below: ▪ Former PFA lagoon with concrete lined basins and separator walls (predominately Phase A but included in southeast corner of Phase B & C). ▪ Foundations associated with historical buildings such as the former 1000T hoppers, conveyor supports and junction houses. ▪ Deep structures associated with the former travelling crane / conveyor and encountered as part of Phase A Enabling Works. ▪ Deep structure associated with former filler pits. ▪ Potential tunnels, suspected in the central southern part of the site.

	▪ Relict test piles installed as part of the recent development works (within Phase B & C boundary). ▪ Below ground structures associated with the former rail sidings. ▪ Below ground structures associated with the former rail depot (east). ▪ Culverted watercourses, such as the former route of the Maw Burn and Cow Gut. These obstructions are not considered exhaustive but summarise information that has been made available to Cundall.
Recent Site Developments	A previous developer (British Volt) responsible for enabling the site for a different proposed commercial end use entered administration in January 2023 and works ceased immediately. Based on the sudden demobilisation, any earthworks undertaken by them are unlikely to have been complete in accordance with the proposed development plans and material movement and handling around the site has not been fully captured within the information available. The QTS Phase A enabling works, which is currently ongoing, covers the west and southern sections of the wider application site which includes the proposed location of DC01 and DC02, generator yards, and the substation along with internal site roads.
Site Topography	Based on topographical data from October 2024 (Section 1.4, Reference 36), existing site levels grade gently from approximately 10.5m AOD in the northwest to around 4m AOD in the southeast of the wider application site, not including stockpiles. PFA stockpiles which occupy the east part of the site extend up to around 15m AOD (north) and 23.6m AOD (south). An additional PFA stockpile is located in the northwest and is only partially within the Phase B & C boundary, its highest point is within the Phase B & C boundary at around 15.3m AOD.
Hydrology	Two named watercourses are present on site: Cow Gut and Maw Burn. The Maw Burn enters the site in the north west, flowing generally from west to east and outfalls to the North Sea. The Cow Gut enters the site in the west, also flowing in an easterly direction and outfalls to the River Blyth. The River Blyth is located approximately 300m south of the site. The North Sea is approximately 250m east of the site.

Table 2-1: Site Details

2.2 Site History

Based on historical mapping and aerial imagery, key development dates and changes are recorded in Table 2-2.

Year	Site Activity
1865	The site is used as agricultural land.
1924	A football pitch, pavilion, and embankment have been constructed on the site.
1940	Railway line and sidings have been constructed in the north and east of the site. Other areas of the site are recorded to be used as allotments and welfare grounds.
1966	The site has been developed for use as a coal storage pad for the Blyth Power Station. A mineral railway with sidings has been developed through the centre of the site, and infrastructure including pylons, floodlighting, conveyors, reservoirs, and other ancillary buildings are recorded.
1992	Mapping shows much of the site infrastructure to have been demolished. Two large mounds of PFA material have been deposited in the eastern site area.
2021	Aerial imagery shows evidence of surface scarring, likely associated with ground investigation and earthworks, as well as the construction of working platforms and haul roads. It is understood that this was in relation to works completed for a previously proposed development scheme (British Volt).

Table 2-2: Key Dates from Historical Mapping Review

The presence of burnt shale on site is thought to be related directly to the historical development of the site whereby it was likely imported as a construction material, its provenance is discussed further in Section 3.1.It is noted that the site was never recorded to be a colliery.

2.3 Ground Conditions

2.3.1 Published Geological Information

The British Geological Survey (BGS) 1:10,000 scale and 1:50,000 scale geological maps of the area (References 43 to 46, Section 1.4) have been reviewed and indicate the wider site is underlain by the following sequence.

Superficial Geology:

- Till deposits to an anticipated depth of around 30mbgl (-25m AOD).

Solid Geology:

- Pennine Middle Coal Measures which are indicated as being interbedded sandstone, mudstone and siltstone in the northeast corner of the site and as sandstone across the rest of the site. Based on the depth at which the Moorland seam was found, the Yard and Plessey is estimated to be around 150m beneath the site.
- The West Sleekburn Dyke is recorded beneath the northern portion of the site trending northwest to southeast. The dyke is recorded as present within the Yard and Plessey seam as shown on the BGS 1:10,560 scale map (Ref. 30, Section 1.4).

Although not shown on the BGS mapping, made ground covers the majority of the site and alluvial deposits are anticipated to be present across the original channels of the Maw Burn and Cow Gut watercourses.

2.3.2 Previous Ground Investigations

Numerous intrusive ground investigations have been carried out at the site. Rolton undertook a series of investigations between 2021 and 2024 to support a different development scheme being brought forward by British Volt. Selected enabling works including excavation and movement of material were undertaken by British Volt following the Rolton ground investigations, although the exact details of these are not known as the scheme was not completed and no verification records are available.

Arcadis then undertook a series of intrusive ground investigations in 2024 and 2025 for the current scheme proposals and produced an interpretive geotechnical and geoenvironmental ground investigation report, which has been accepted for discharge of planning conditions associated with the outline planning application for the wider site.

The ground conditions described subsequently were recorded in the Cundall Ground Conditions report (Reference 10) and are summarised below. The ground conditions are based on information provided within the Rolton and Arcadis ground investigation reports (References 29 and 38). Shallow ground conditions recorded by Arcadis vary slightly to what was recorded by Rolton as a result of the enabling works undertaken between investigations. Exploratory hole locations are shown on the 'Combined Exploratory Hole Location Plan' drawing (GBR1-DCZZ-XXX-UG-DR-B-01-01 - appended to this report). A Geological Cross-Sectional drawing (GBR1-DCZZ-CDL-STE-XX-DR-B-0013) has been produced for the site and is also appended to this report (Reference 23).

2.3.3 Artificial Deposits

2.3.3.1 Made Ground

Made Ground was encountered across the entirety of the site and has been characterised into a variety of subcategories based on its visual appearance and BS 5930 description. Made Ground material categories are listed below.

- Topsoil
- Asphalt
- Concrete
- Railway Ballast
- Organic Made Ground
- Surface Cover Granular

- Pulverised Fuel Ash (PFA)
- Granular Subgrade
- Burnt Shale
- Reworked Clay
- Granular General Made Ground

2.3.4 Superficial Deposits

Superficial geology at the site has been considered for the site as a whole. Ground conditions for the Phase B & C boundary are not anticipated to significantly deviate from the below.

2.3.4.1 Alluvium

Alluvium was identified in small clusters of positions which partially aligned to the historical channels of the Cow Gut and unnamed watercourse. However, Alluvial deposits did not follow the entire channel of the historical watercourses and are not identified as being present as a continuous layer across where the historical channels were located. Where Alluvium is present on site it is typically described as a soft to firm greenish brown / dark grey slightly sandy slightly gravelly clay. Gravel is fine to coarse subangular to subrounded of coal, siltstone, mudstone, sandstone and coal fines. Occasional pockets of organic inclusions and an organic odour were also recorded.

2.3.4.2 Till

Till is typically present across the site from between ground level and approximately 2.5mbgl (depth to top). The depth to the top of the stratum is greatest in the central section of the site, associated with the historic channel of the unnamed watercourse becoming slightly deeper in the central section of the site (beneath the areas of asphalt surfacing). Till is logged as a clay in almost all exploratory holes. Descriptions are generally consistent across the site as firm to stiff, becoming very stiff with depth, dark greyish brown slightly sandy slightly gravelly clay. Gravel is angular to subrounded fine to coarse of various lithologies. Log descriptions for the upper 5m of Till are indicative of a slightly weathered profile with the material being recorded as a firm mottled light grey / blue sandy slightly gravelly clay.

Granular layers were recorded in a limited number of positions (around nine locations). These were recorded as lenses and are not considered to be a continuous layer. Descriptions were given as dense to medium dense sand and gravel. Gravel is of sandstone, siltstone and limestone. The thickness of Till is generally between 20m and 30m where the full thickness is proven.

A number of falling head permeability tests were undertaken in the well installations, targeting the slightly sandy slightly gravelly Glacial Till during both the Rolton and Arcadis ground investigation. The results are consistent with the expected permeability of clay ranging from an almost impermeable to very low permeability.

2.3.5 Bedrock

Solid geology at the site has been considered for the site as a whole and no specific deviation from this is noted within the Phase B & C site boundary.

2.3.5.1 Pennine Middle Coal Measures

Solid geology at the site is the Pennine Middle Coal Measures which features interlayered bands of extremely weak to moderately strong mudstone and siltstone and moderately strong sandstone. Rockhead was encountered from -13.6m to -27.6m AOD. Bands of coal were encountered at varying depths (from -18.91m and -85.65m AOD) and were typically described as extremely weak and weak coal with pyrite present.

2.3.5.2 West Sleekburn Dyke

The West Sleekburn Dyke was not encountered during the ground investigation but is shown on the 1:10,000 geological map to pass beneath the northern part of the wider Cambois site trending northwest - southeast. The West Sleekburn

Dyke is a mafic igneous intrusion with a top surface at a similar level to the Pennine Middle Coal Measures. It is reported to be around 15m wide under Section 4.2.3 of the Arcadis Desk Study report (Ref 3, Section 1.4).

2.4 Below Ground Obstructions

During the Phase A enabling works, a deep structure, referred to as a 'culvert', was encountered below the proposed substation trending roughly west to east and was dry. It is anticipated that this culvert extends into the Phase B & C Enabling Works area and in particular across the proposed building footprints.

Details of the culvert have been discussed in Cundall reports and drawings including the desk based historical assessment (GBR1-ENA2-CDL-STE-XX-RP-B-1004), Ground Conditions Summary report (GBR1-ENA2-CDL-STE-XX-RP-B-1002) and Below Ground Features Plan (GBR1-ENA2-CDL-STE-XX-DR-B-1011).

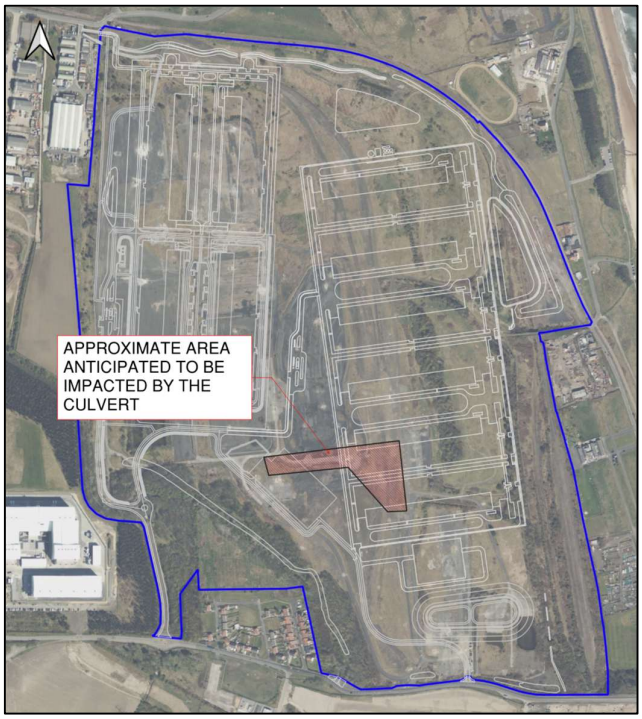


Figure 2-1: Area to be Impacted by Culvert (Reference 11)

2.5 Landfills and Waste

The Envirocheck report obtained for the Arcadis desk study (Reference 35) indicates that there are no active landfills within 1km of the site. However, the two PFA mounds located within the site boundary are recorded as historical landfills, described as 'ash mounds'.

The mounds were constructed under a former Waste Management Licence and comprise the disposal of PFA and FBA. The operator and licence details are Innogy, Land adjacent to Blyth Power Station, Bedlington, Northumberland, NE22 7BW, reference 67373 dated 10 November 1992 for the deposition of waste including industrial waste equal to or greater than 75,000 tonnes per year. The licence was surrendered on 20 July 2004. This material is on the wider Cambois Campus site and is not subject to an Environmental Permit, as per previous discussions with the Environment Agency.

2.6 Mining Legacy

The Cambois Campus site is located within a coal mining reporting area with a portion of the site (north-west corner) falling in a high-risk development zone, as defined by the Mining Remediation Authority (MRA - formerly the Coal Authority). The high-risk development zone falls within the Phase B & C boundary. Coal Mining Risk Assessment

Reports have been produced by both Rolton and Arcadis (Reference 42). The following key observations and conclusions have been noted.

- Six coal seams are recorded beneath the site between 104 and 218m in depth. These are considered too deep to impact the proposed development and have not been considered further.
- Potential shallow mine workings were identified by the MRA in the northwestern portion of the site associated with the outcropping Charlaw / Moorland seam, this has been designated by MRA as a High-Risk Development Zone.
- None of the intrusive investigations, including one undertaken specifically to identify mine workings within the High-Risk Development Zone, recorded evidence of shallow mine workings or mining related voids.
- Intact coal seams were recorded within 100m of the surface.
- There is no evidence of mine entries, opencast mines, coal authority managed tips or spine roads on or within 100m of the site boundary.
- There is no Coal Authority record of a damage notice, claim, court orders, active stop notice or request for preventative works on or within 50m of the site boundary that may indicate subsidence issues.
- There is no record of mine gas emissions or mine water treatment schemes within 500m of the site boundary.
- There is no record of future underground mining intents or coal mining licences within 200m of the site.

Notably the site was never recorded to be a colliery, it is anticipated that the burnt shale material identified in Section 2.3.3.1 was imported to site as a general fill material during the construction of the coal stocking yard.

2.7 Ground Gas

Gas monitoring has been undertaken in a number of phases, with some limited enabling works undertaken on site between the Rolton and Arcadis investigations. Ground gas monitoring undertaken is summarised in the Cundall Detailed Remediation Strategy (Reference 24). Thirty-seven boreholes were installed with monitoring wells within the Made Ground (or cross installed between Made Ground and Till). It is anticipated that only made ground with sufficiently high organic content would represent a potential source of ground gas risk, this does not include burnt shale material.

Based on the limited ground gas sources present on site, the classification of the site as CS-1 based on the majority of data obtained to date and the further proposed removal of putrescible materials below the proposed buildings further reducing residual risks associated with potential ground gas sources during the enabling works; the site should be classified as characteristic situation 1 with no ground gas protection measures required. The burnt shale material does not represent a potential source of ground gas.

2.8 Hydrology and Water Features Survey

As reported within the Arcadis desk study (Reference 35), a small area in the south-east of the wider Cambois Campus (but not located within the Phase B & C boundary) falls within flood zone 2. The remainder of the site is not located within a risk zone for flooding from rivers or the sea. Localised areas of the site associated with existing drainage channels are indicated to vary from low to high risk of surface water flooding.

According to the Envirocheck report obtained for the site (Reference 35), there are two surface water abstractions within 1km of the site. These relate to abstractions from the River Blyth approximately 185 and 210m south for general cooling uses. However, these were issued to National Power Plc for the now demolished Blyth A and B Power Stations.

Two named watercourses are present on site; Maw Burn in the north and Cow Gut in the south. Both of these watercourses have been culverted for most of their length across the site and flow generally from west to east. The Maw Burn enters the site at the north western boundary, bending towards the south and then outfalling to the east into the North Sea. The Cow Gut enters the site in the west and exits at the southern boundary, outfalling into the Blyth Estuary. It should be noted that the Cow Gut flows through the Phase A enabling works area as well as Phase B & C enabling works area, and existing drainage from within the site connects to the Cow Gut. The lowest elevations of each watercourse are approximately 5.2m AOD (invert level from Phase B Drainage Layout GBR1-RMAPB-CDL-STE-XX-DR-C-1011) within the Maw Burn (near the outfall in the east) and 3.1m AOD (invert level from Phase A Drainage Layout NCL1-RMAPA-STE-XX-DR-C-01-33) within the Cow Gut (south east of the site).

The Arcadis desk study details a number of licensed discharge consents within the wider Cambois Campus, these are recorded as revoked or lapsed and relate to various operations and discharging predominantly into Cow Gut or Maw Burn. The routes of these watercourses were to be diverted as part of the previous British Volt scheme. The diversion of Maw Burn was completed with an open channel along the northern site boundary, connecting to an existing drainage channel around the eastern side of the northern PFA mound, before rejoining the original outfall from site.

Details of the existing watercourses are shown in References 19 and 20. The location of these watercourses, contributing drainage and their outfalls are shown on Figure 2-2. It is understood that ground conditions surrounding the watercourses comprise predominantly Made Ground / Alluvium.

Standing water has been noticed across the site after periods of heavy rainfall, particularly in the north east of the site. It is understood that this water acts as baseflow to the open channel of the Maw Burn to the north. Similarly, during extended periods of dry weather, the Maw Burn is observed to be dry at its point of entry to the site in the north east but does have flow downstream, indicating some baseflow contribution from groundwater within the laterally discontinuous and perched made ground. This has been the case during enabling works (see Section 2.8.1 for commentary on the Maw Burn being dry at point of entry following an extended hot and dry spell of weather during summer 2026).

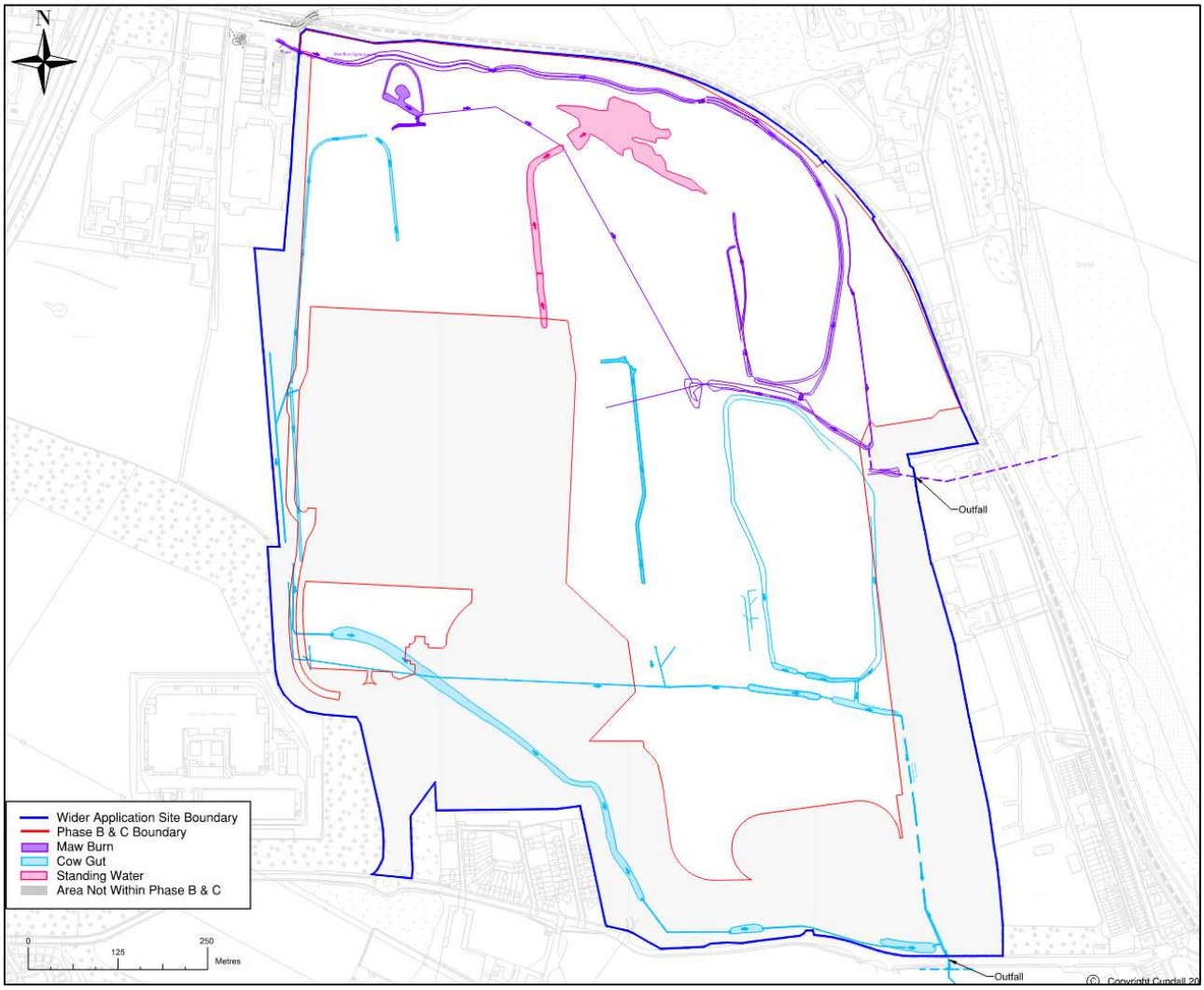


Figure 2-2: Existing Water Features Plan

As part of the Phase A enabling works, works have been undertaken to divert the Cow Gut and a SuDS pond has been installed in the southeast of the site. The SuDS Pond shall act as a collection point for surface water on site (as indicated on the drainage layout, Reference 25) before discharging into the Cow Gut via an orifice flow control chamber, after

which water shall discharge via the existing outfall from the Cow Gut into the Blyth Estuary. A silt fence will be constructed where there is runoff from the enabling works platforms to Cow Gut. This is to capture sediment from the enabling works prior to discharge to Cow Gut. The lowest elevation within the SuDS Pond in the southeast is 2.82m AOD, which includes a minor excavation into the Glacial Till (from ~3.5m AOD).

The Cow Gut has been partially realigned, with a secondary channel following the southern boundary of the wider Cambois campus before rejoining the original route and outfalling into the Blyth Estuary; this route is partially culverted. Where the surface water bodies are not culverted, there is potential for contribution to baseflow from groundwater, if intersecting a groundwater body. Several open concrete-lined drainage channels are present across the site around the former coal stock areas and PFA mounds; these appear to drain into Maw Burn and Cow Gut.

Dye tests were successfully carried out in August and September 2025 to demonstrate the hydrological connectivity of Cow Gut from the proposed development to its outfall point into the River Blyth (Reference 17). The results of these tests satisfy the planning authority's requirements for surface water outfall verification and support the development's compliance with drainage and environmental standards.

The Blyth Estuary is located approximately 300m south of the site and is part of the Northumberland Shore SSSI. The Blyth Estuary has a high river flow rate of 7870l/s (Reference 1). The Blyth water body has a 'Moderate' ecological status according to the Environment Agency. The North Sea is approximately 250m east of the site.

2.8.1 Surface Water Monitoring

Surface water sampling undertaken in 2024 by Arcadis (Reference 34) indicates that in the current layout (where groundwater can provide some baseflow to surface waters) site soils are not significantly impacting water quality within the Maw Burn and Cow Gut as concentrations appear higher upgradient than downgradient.

A further three rounds of surface water samples were taken from seven monitoring points along the Cow Gut and Maw Burn in July 2026 (however, only six locations yielded a total of eighteen samples as one location was dry on every visit), for a suite of determinants the results of which were compared to EQS threshold criteria are summarised in Appendix B. Three samples were taken from each location on 6 July 2026, 13 July 2026 and 20 July 2026 as follows:

- Maw Burn entering site in open ditch (SW-05) recorded to be dry, with insufficient water available to sample on every visit.
- Maw Burn open ditch at concrete headwall leaving site (SW-07)
- Maw Burn outfall onto beach (SW-08)
- Cow Gut entering site in open ditch (SW-03)
- Cow Gut entering site at manhole (SW-04)
- Cow Gut leaving site in open ditch (SW-11)
- River Blyth outfall (RBOF)

As the North Sea and the River Blyth are both classified as saline water bodies, and the Cow Gut and Maw Burn are classified as freshwater bodies, samples have been assessed against both freshwater and saltwater criteria as appropriate to the identified surface water body.

Samples assessed against EQS freshwater criteria identified elevated concentrations of Boron, Cadmium, Chromium III, Copper, Nickel, Zinc, Fluoranthene and Benzo(a)pyrene.

Samples assessed against EQS saltwater criteria identified elevated concentrations of Cadmium, Copper, Zinc, Fluoranthene and Benzo(a)pyrene.

Chemical and Biochemical Oxygen Demand tests were undertaken on all samples. The Biochemical Oxygen Demand (BOD) results from the Cow Gut and Maw Burn would generally classify these surface water bodies as being of "Poor" quality as a lowland high alkalinity river in accordance with the UK-TAG on the Water Framework Directive (>9mg/l). The BOD results from the River Blyth outfall classifies this water body as being of "Moderate" quality (<6mg/l) as a lowland high alkalinity salmonid river.

2.9 Hydrogeology

2.9.1 Aquifer Characteristics

The superficial Till deposits are classified as a Secondary (undifferentiated) Aquifer by the Environment Agency. The Pennine Middle Coal Measures are classified as a Secondary A Aquifer and the West Sleekburn Dyke is classified as a Secondary B Aquifer by the Environment Agency. The site does not lie within 1km of a groundwater Source Protection Zone and no groundwater abstraction points are recorded within the site boundary.

2.9.2 Groundwater

Groundwater monitoring was carried out across the wider Cambois campus during all phases of intrusive investigations with 85 installations in total with response zones present in Made Ground, Till, and Pennine Middle Coal Measures. Discontinuous water bodies were recorded in both the Made Ground and Till, and these are considered unlikely to plausibly support any potential abstraction or significant through-flow.

A laterally continuous groundwater body has been identified within the Pennine Middle Coal Measures Formation. According to the Arcadis Ground Investigation Report (Reference 29), groundwater levels recorded in monitoring wells installed within this stratum ranged from 2.633m AOD to 0.479m AOD (3.383m bgl to 9.520m bgl). These elevations indicate that the groundwater is confined beneath an overlying layer of Till, which varies in thickness between approximately 20m and 30m.

The presence of this substantial low permeability Till layer suggests that the groundwater within the Pennine Middle Coal Measures behaves as a confined aquifer, with limited vertical recharge and potential for artesian conditions. The consistency in groundwater levels within the Pennine Middle Coal Measures across the site further supports the interpretation of a laterally extensive groundwater body within the formation. Groundwater was not found to be tidally influenced but no definitive flow direction was able to be discerned due to the confined / perched nature of water-bearing strata. A ‘Water Level Contour Plan and Sections’ drawing (GBR1-DCZZ-XXX-UG-DR-B-01-03) has been produced and is appended to this report.

Groundwater quality levels / groundwater catchment area data does not exist for the Site under the Environment Agency.

3.0

Preliminary Conceptual Site Model

3.0 Preliminary Conceptual Site Model

The sections below relate only to the burnt shale material proposed to be reused under the deposit for recovery activity. The Conceptual Site Model (CSM) for the wider Cambois Campus site, as presented by Arcadis Report (Reference 29), is reproduced in Appendix A for additional context only and does not identify burnt shale as a specific source of contamination. The CSM in Appendix A has been accepted for discharge of planning conditions associated with the outline planning application for the wide Cambois Campus site.

3.1 Sources

The last coal mine in Northumberland closed in 2005, prior to the Mine Waste Directive (2006/21/EC) in 2006. As such, the burnt ahale present on site is considered the result of a purposeful import and placement as fill material. Historical records, including mapping, show the site was built for use as a coal stocking yard for the adjacent power station prior to 1966. The burnt shale material was likely produced or excavated at an off-site (unknown) source and subsequently placed on site as engineered fill. Most of the burnt shale is found below existing ground level, suggesting it was deliberately imported and placed.

As the conceptual site model outlined in this section is only in relation to deposit for recovery activities, the only potential source of contamination considered is burnt shale. No other materials are proposed to be recovered under an Environmental Permit.

3.1.1 Material Description

Burnt shale was recorded in a number of exploratory positions across the site, predominantly in the centre and the south, although appears to be absent below the PFA mounds. Burnt shale was recorded during all phases of investigations but particularly during the Rolton ‘Burnt Shale’ investigation, which was targeted to understand the extent of the material.

Descriptions of the material as provided by both Rolton and Arcadis are variable. Rolton note the material as red / orange in colour and primarily encountered as sandy gravel with frequent cobbles of burnt shale. A hydrocarbon odour was recorded in three positions; CPT119, CPT120 and TP83 (noting that only TP83 is located within the Phase B boundary). It was occasionally locally interbedded with general made ground and has likely been present on site for some time and is significantly weathered. This description from Rolton is generally consistent throughout all three phases of their ground investigation.

Arcadis described burnt shale as a reddish brown, occasionally grey, gravel or sand where gravel is of burnt shale featuring other constituents (such as mudstone, concrete and sandstone). Notably Arcadis only classified the material as “Burnt Shale” where material was considered to comprise >50% visually burnt shale material.

All investigations were carried out in accordance with BS5930 and as such the proportion of burnt shale in a given stratum was not required to be quantified in the material description.

Cundall’s assessment of burnt shale has assumed that the classification of strata provided by others (Arcadis and Rolton) are accurate. However, where Cundall have noted strata to have descriptions consistent with ‘Burnt Shale’ materials, these have been included within burnt sale dataset. The material classified as burnt shale for the purposes of this report are therefore likely to represent the maximum volume of material to be classified as such and reclassification for the purposes of reuse and environmental permitting may be required at a later date.

Burnt shale was encountered across the majority of the site, including directly adjacent to surface water bodies. Recorded thicknesses generally ranged between 0.2m and 1.0m. Ten positions in the northwest of the site recorded greater depths of burnt shale (between 0.9m and 3.3mbgl) corresponding roughly to where the former railway entered the site.

3.1.2 Chemical Testing

Chemical testing has been undertaken on samples of burnt shale from both the Rolton and Arcadis investigations as well as from stockpiled material from the Phase A enabling works. Chemical testing was undertaken on twenty-two soil leachate samples on a 10:1 ratio. Concentrations above freshwater and saltwater EQS threshold criteria were recorded for determinants including Cadmium, Copper, Lead, Mercury, Nickel, Zinc and Fluoranthene. Results of this testing is discussed further in Section 5.1.

3.1.3 Data Discrepancies

During the British Volt enabling works, it is understood that localised excavations and removal / replacement of soils were undertaken, particularly in the south where the more significant volumes of burnt shale were previously identified in investigations before these works.

During the Arcadis 2024 ground investigation, burnt shale was predominantly recorded in the southern part of the site below a layer of granular made ground. Smaller areas in the north west and central area of the site also recorded burnt shale but it appeared to be present in much smaller areas than that recorded during Rolton GI. This is likely to be as a result of:

- The previous enabling works (carried out in circa 2021) may have resulted in the relocation or off-site disposal of material described as burnt shale. This is certainly apparent in the southern part of the site (predominantly Phase A) where ground levels are lower than those recorded pre enabling works and above ground stockpiles have been formed.
- Logging of soils undertaken by Rolton may not give a representative view of the material type and classed material as ‘Burnt Shale’, whereas this may have been a made ground material with evidence of some / occasional / rare burnt shale fragments.
- As mentioned previously, Arcadis has logged soils as burnt red shale where ‘logged material is >50% burnt shale’ and although this methodology is considered reasonable, this is a subjective approach and will depend on the logging engineer.

It is likely that the discrepancy associated with recording burnt shale is likely to be a combination of all three of the above, but it should be noted that there is no evidence of an active mine within the boundary of the site that may have contributed to the significant generation burnt shale as a mining waste product on site (i.e., it can only have been imported).

The likely extent and thickness of burnt shale is highlighted on drawing ‘Approximate Location and Thickness of Burnt Shale’ GBR1-ENA2-CDL-STE-XX-DR-B-1004 (appended to this report).

3.2 Pathways and Receptors

Based on guidance presented in the Environment Agency’s Land Contamination Risk Management (LCRM) guidance, the following potential pathways and receptors have been identified in relation to the recovery of burnt shale and controlled waters risks, as regulated by the Environment Agency. Risks to human health for the site are regulated by the Local Planning Authority through the accepted Remediation Strategy (Reference 24). These do not take into account any of the design proposals, which will be outlined in Chapter 4.0 with a refined conceptual site model in Chapter 5.0.

3.2.1 Potential Pathways

- Overland flow into surface water features on site (Cow Gut / Maw Burn)
- Outfall from onsite surface water features to offsite surface water features (Blyth Estuary / North Sea)
- Lateral / vertical leaching to surface water features via groundwater
- Vertical migration of groundwater to underlying aquifer
- Preferential pathways from existing drainage

3.2.2 Potential Receptors

- Cow Gut and Maw Burn (Surface Water)
- Blyth Estuary (Surface Water)
- North Sea (Surface Water)
- Groundwater in Pennine Middle Coal Measures (Secondary A Aquifer)

4.0

Development Proposals

4.0 Development Proposals

4.1 Proposed Works

The proposed works for the Site (Phase B & C) comprises the following:

1. **Site Preparation and Enabling Works:** Earthworks to adjust site levels to formation level, including the removal of below ground obstructions (including legacy surface water drainage), removal of stockpiles, installation of temporary drainage systems to support pile mat construction and construction of temporary car parks. Minor diversion of Maw Burn watercourse to accommodate the proposed building platforms (refer to Reference 16) – note that the outfall location shall not change.
2. **Groundworks**: Execution of below-ground preparatory works to support the development of Phase B & C, including installation of drainage infrastructure.
3. **Construction:** Delivery of the development proposals as detailed in Section 1.2, including all associated structural, drainage and architectural elements.
4. **Removal of Construction Phase Car Park:** Following construction of all three phases, the car park shall be removed and replaced with an attenuation/landscaping area. Designs are yet to be finalised but are anticipated to take place within 10 years of the construction of the car park.

Further pertinent details are provided in the subsequent sections.

4.2 Site Levels

4.2.1 Existing Site Levels

Current site levels grade from approximately 12.2m AOD in the north west to around 5.0m AOD in the south (Reference 12). A number of stockpiles are recorded on site, with a maximum elevation of 22.8m AOD. An area of low-lying ground is located in the north east of the site (8.4m AOD), where standing water accumulates.

4.2.2 Enabling Works Levels

Proposed enabling works levels (Reference 8) indicate that site levels will generally be raised beneath proposed building footprints in the south of the site and remain approximately as existing or lowered in the north of the site. Any stockpiled material is to be reused (Reference 7) and the area where standing water is encountered shall be raised to form a temporary car park during construction.

The proposed enabling works finished levels are listed below.

- Beneath proposed data centre buildings (DC03 and DC04) approximately 10.9m AOD
- Beneath proposed data centre buildings (DC05-DC10) approximately 10.0m AOD to 10.5m AOD
- Beneath the proposed car park in the south approximately 9.8m to 10.0m AOD
- Beneath the temporary car park in the north approximately 11.0m AOD

The proposed finished enabling works levels are shown on Proposed Enabled Ground Level drawing GBR1-ENA2-CDL-STE-XX-DR-C-1301.

4.2.3 Proposed Finished Levels

Proposed finished levels (Reference 26) are generally in line with the enabling works levels, with areas beneath building footprints raised and slopes regraded.

4.3 Earthworks Proposals

Current earthwork proposals (RIBA 4 design stage) include excavation and reuse of Made Ground deposits (including burnt shale). Geotechnically and chemically suitable materials are to be reused. Notably the use of deleterious, compressible high organic material or any material with visual or olfactory evidence of contamination is precluded from the scheme. The geotechnical and chemical suitability of burnt shale, based on the existing geotechnical and geoenvironmental testing is also outlined in the Waste Recovery Plan (Reference 1). Earthworks zones for Phase B & C are indicated on the figure below. Selection of particular material types (i.e. burnt shale) are not defined. Scheme proposals for each area are described in the subsequent sections.

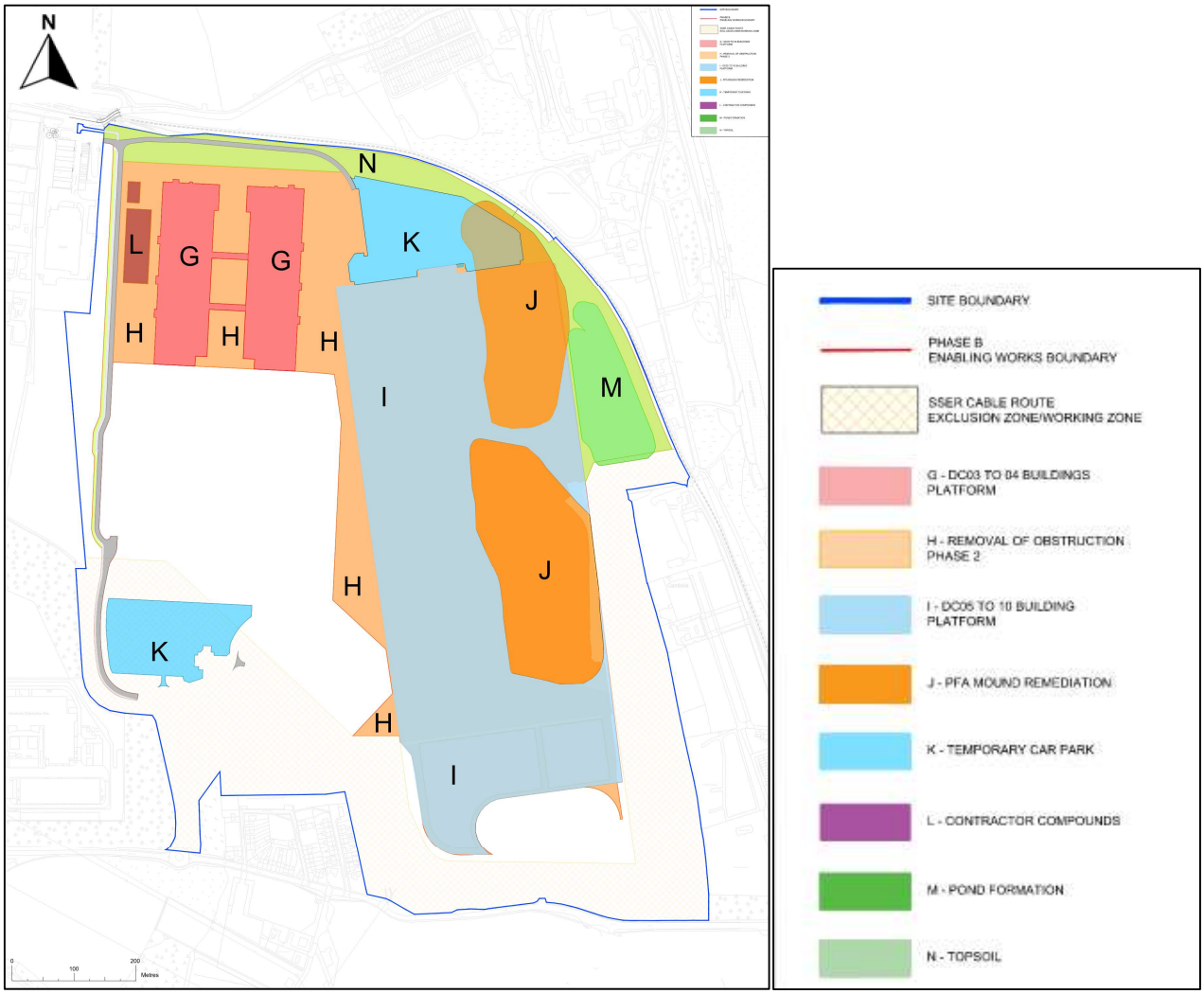


Figure 4-1: Phased Earthworks (GBR1-ENA2-CDL-STE-XX-DR-B-1008)

4.3.1 Zone G

The primary objective of earthworks in Zone G is to break out / excavate all surface material (hard and soft) and excavate to a depth to accommodate a granular working platform (base of platform proposed to be between 9.5m AOD and 10.0m AOD).

A preliminary working platform calculation has been undertaken using an assumed rig load and this indicates a platform thickness of 840mm of granular material will be required to be installed below the proposed enabling works level. The working platform across DC03 and DC04 buildings shall be a higher level than the platform across the proposed generator yards. Reference should be made to Drawing GBR1-ENA2-CDL-STE-XX-DR-C-1301.

Obstructions will be required to be removed in their entirety, including those identified on the Below Ground Features Plan and Existing Constraints Plan along with any additional obstructions identified during earthworks. Where the existing ground level is lower than the proposed base of the working platform, an extra over dig of 0.75m should be carried out to identify any potential below ground obstructions.

Backfilling will comprise the placement of engineered granular fill to achieve the enabling works finished ground level. Where existing levels are lower than the base of the working platform, the backfill shall comprise general fill.

4.3.2 Zone H

Zone H includes external areas to the proposed data centre buildings. Service corridors are anticipated to be required across Zone H to facilitate the wider development.

Earthworks will comprise a minimum of 0.75m excavation below existing levels. Where obstructions are encountered within this excavation, these shall be excavated and fully removed or cropped to a minimum elevation of 7.5m AOD, where they extend below this level.

An existing area of standing water is present across part of Zone H, its location is shown on Cundall's 'Surface Cover Materials' drawing (GBR1-ENA2-CDL-STE-XX-DR-B-1002) This area will require dewatering with all soft material fully excavated and filled with suitable material to the required level. Backfilling will comprise suitable general fill to achieve proposed levels and will include an upper 150mm layer of engineered granular material (Class 6) as a protective surface, if required by the Client.

4.3.3 Zone I

Zone I includes the area currently proposed for the construction of DC05 to DC10 outside of the two large PFA stockpiles.

All known obstructions are required to be removed in their entirety beneath proposed building footprints (including the culvert identified during Phase A works). Possible mitigation options for the culvert have been summarised in a Cundall Design Note 'Culvert Mitigation Options' (GBR1-DCZZ-CDL-STE-XX-RP-B-0019).

Beyond the removal of known obstructions, earthworks comprise an excavation to the lower of 0.75m below existing ground level or proposed ground level.

Backfilling shall comprise suitable general fill to achieve proposed levels and will include an upper 150mm layer of granular general fill material (not burnt shale) as a protective surface, where available. If no granular material is available, other materials may be used in the temporary case but would likely require removal from site in the permanent case due its lack of engineering suitability.

4.3.4 Zone J

Zone J includes the area currently proposed for the construction of DC05 to DC10 beneath the PFA stockpiles.

Earthworks proposals comprise the partial removal of the existing PFA stockpiles down to an elevation of approximately 10m AOD. Where obstructions are identified during the earthworks, these shall be excavated in full. Excavations shall refer to the Cundall Existing Mound Removal to Site Strip drawing (GBR1-ENA2-CDL-STE-XX-DR-C-1303). Material excavated should be used in the earthworks on the remainder of the site and in accordance with the Rolton Geotechnical Design Report and Outline Earthworks Specification document and the appropriate WRAP Quality Protocol.

General backfilling is anticipated to only be required if obstructions are identified. Backfilling shall comprise suitable general fill to achieve proposed levels and will include an upper 150mm layer of granular general fill material (selected to provide a uniform grading and suitable surface condition as a protective surface where available. If no granular material is available other materials may be used though these would then likely require removal from site in the permanent case due its lack of engineering suitability.

4.3.5 Zone K

Zone K includes the temporary car park which shall be used during the construction phase of the works.

Earthworks will comprise excavation to 0.60m below proposed pavement level. Where obstructions are encountered within this depth of excavation, these shall be excavated and fully removed or cropped to an elevation of 7.5m AOD, whichever is the deeper. Former test piles installed by the British Volt scheme are known to be present in Zone K and require cropping to 7.5m AOD (locations provided on the Below Ground Features plan).

The area of existing standing water as discussed as being present in Zone H also encroaches across Zone K. Similar to requirements for Zone H. This area will require dewatering with all soft material fully excavated and backfilled with suitable materials to the required level as shown on Cundall's 'Existing Ground Level to Enabling Finished Ground Level'.

4.3.6 Zone L

Zone L includes General Contractor (GC) laydown areas.

Earthworks will comprise excavation to the lower of 0.75m below existing ground level or proposed ground level followed by placement of general fill and then 0.3m of suitable material underlain by a geotextile membrane to achieve finished levels.

4.3.7 Zone M

Two attenuation ponds will be constructed within Zone M and this is predominantly in an area of excavation. The proposed pond build up is shown on Cundall 'Enabling Works Phase C – Drainage Details Sheet 3' drawing (GBR1-ENA2-CDL-STE-XX-DR-C-5412).

Earthworks will comprise excavation to a minimum depth of 0.30m below finished levels to accommodate and suitable fill material, as detailed in Drawing GBR1-RMAPC-CDL-STE-XX-DR-C-1019 and within Arcadis Landscape Specification.

Obstructions will be required to be removed to a maximum depth of 0.50m below the invert level of any drainage pipework or 0.50m below the pond levels.

4.3.8 Zone N

Zone N runs around the north and north eastern boundary of the site and will be landscaped in accordance with the Arcadis Landscape Specification and associated drawings. The earthworks undertaken in this part of the site must also consider the adjacent Network Rail land.

The earthworks will comprise the breaking out and removal of obstructions and removal of surface material, followed by the placement of a clean cover system (comprising geotextile separation layer and a minimum 300mm of clean soils).

4.3.9 Previously Identified Culvert

Four mitigation options have been identified to prevent future collapse / settlement and /or clashes with foundations and below ground services as a result of the culvert identified in Phase A and thought to extend into Phase B & C (Reference 11).

- Retain the culvert in situ with no treatment, which would require detailed investigation and potentially complex foundation, slab and service design to accommodate ongoing uncertainty and settlement risk (no earthworks is currently required beyond any localised excavations required for foundations and services);
- Retain and grout-fill the culvert to reduce collapse risk, improving ground conditions but still requiring consideration of the structure during foundation and service design;
- Fully excavate and remove the culvert and associated structures, eliminating the obstruction and providing the greatest certainty for future development, albeit with significant earthworks, backfilling and associated cost implications; and

- Revise the development layout to avoid the culvert entirely, thereby limiting the extent of mitigation works required.

At the time of writing optioneering is ongoing with no confirmed solution, a decision is likely to be made during the determination period of the burnt shale permit.

4.4 Basal and Side Slope Engineering

All burnt shale materials are proposed to be reused as fill materials for the earthworks. No basal or side slope engineering is proposed for the development.

4.5 Proposed Surface Water Management

The permanent works Proposed Drainage Strategy (NCL1-DCZZ-STE-UG-RP-C-00-01) and the addendum to the Enabling Works Drainage Strategy – Enabling Works Phases A, B and C (NCL1-ENA1-STE-UG-RP-C-00-02) has been submitted to and approved by the Lead Local Flood Authority (LLFA).

4.5.1 Drainage Infrastructure Implementation – Enabling Works

The drainage strategy for Phase B & C enabling works has been submitted for planning to enable the site ahead of the main construction. All Phase B & C enabling works drainage shall be conveyed via filter drains to the drainage pond in the south of the site (constructed as part of the Phase A works), which thereafter outfalls to the Cow Gut via an orifice control chamber or to the Maw Burn in the north. Water shall discharge at a rate that is lower than the equivalent greenfield runoff rate for the contributing catchment. As a result, the proposed arrangements do not increase flood risk to either receiving watercourse. The level of water quality treatment provided through the combination of filter drains, settlement within ponds, and controlled discharge is appropriate for the proposed land use and aligns with SuDS treatment requirements for data centre development.

The drainage system is indicated on Figure 4-2 and is shown in further detail on the Phase B & C Drainage Layout (Reference 15). The works consist of:

- Removal of all legacy surface water drainage systems.
- Diversion of the Maw Burn to accommodate proposed building platforms.
- Drainage to piling platform for DC03 and DC04 via perforated pipework and a filter drain in the north west of the site, to discharge into the Phase 1 permanent drainage pipework, connecting to the drainage pond and by extension the Cow Gut in the south of the site.
- Drainage to piling platform for DC05, DC06 and DC07 via filter drains to drain to the diverted section of the Maw Burn.
- Drainage to piling platform for DC08, DC09 and DC10 via filter drains to the permanent Phase 1 attenuation basin.

A separate construction phase surface water management plan will be submitted for approval to the LLFA.

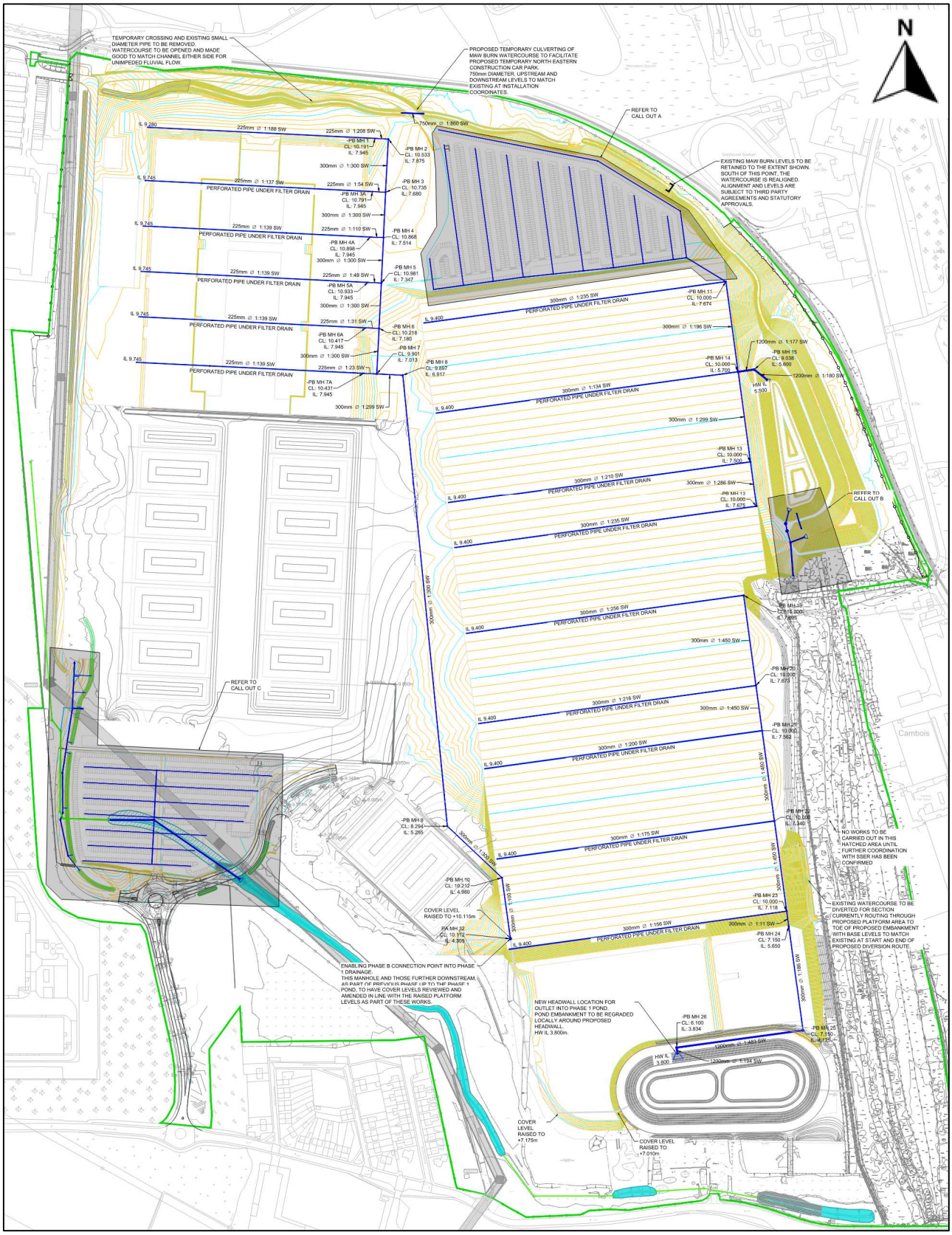


Figure 4-2: Phase B&C Enabling Works Drainage Layout (Reference 16)

4.5.2 Exceedance Flows

Overland flow routes are indicated on Figure 4-3 for the enabling works phase. New temporary cut off trenches have been formed to the north of the enabling works area to capture overland flow. Areas that have flow entering Maw Burn and Cow Gut pre-development maintain an overland flow route to their respective watercourse during Phase B and C.



Figure 4-3: Exceedance Flow Route During Enabling Works

4.5.3 Drainage Infrastructure Implementation – Permanent Works

The permanent works Proposed Drainage Strategy (NCL1-DCZZ-STE-UG-RP-C-00-01)) has been submitted to and approved by the Lead Local Flood Authority (LLFA).

Permanent works drainage shall be implemented following enabling works for all phases. Discharge from proposed attenuation ponds to the Maw Burn and Cow Gut shall be limited to greenfield runoff only.

4.5.4 Total Off-site Discharge

Total proposed off-site discharge in the permanent case for peak flows of the Maw Burn and Cow Gut have been calculated as follows (as per Drainage Strategy, Reference 32):

- Maw Burn – 597l/s
- Cow Gut – 1010l/s

4.5.5 Removal of Construction Phase Car Park

During the construction of the development, the car park shall be removed and replaced with an attenuation/landscaping area. Designs are yet to be finalised but are anticipated to take place no more than 10 years post construction of the car park. Elevations within the attenuation pond replacing the car park are yet to be finalised. However, the lowest elevations within the attenuation pond shall not be lower than that of existing water features on site..

4.6 Foundations

The data centre buildings (DC03 and DC04) are likely to be constructed using a ground floor slab supported on vibro stone columns and the superstructure supported on piled foundations. Detailed pile design is yet to be undertaken for DC03 to DC10. However, based on design proposals for DC01 and DC02 (Reference 21), it is anticipated that 25m length contiguous flight auger (CFA) piles to be constructed below the data centre buildings and the gantry support columns within the generator yards shall be proposed, terminating within the Till.

4.7 Surface Cover

Following completion of the permanent works, the Site is to comprise a combination of hard surfacing with formal drainage and soft landscaping along the northern edge of the site). As defined in the Landscape Specification (Reference 3), all new planting areas excluding wildflower / wet wildflower areas are to be surfaced with reuse of existing soils (where suitable -) or with imported topsoil to BS 3882 (sandy clay loam) standards. Areas proposed for grassland areas with wildflowers shall comprise 100 – 150mm low fertility soil above 150 – 200mm clean materials in line with the Remediation Strategy (Reference 27). On this basis the effective recharge of water to the ground is likely to be negligible during the site's end use.

5.0

Refined Conceptual Site Model

5.0 Refined Conceptual Site Model

5.1 Review of Pathways

The proceeding sections review the pathways identified in Section 3.2.1 in the context of the proposed development proposals outlined in Chapter 4.0.

5.1.1 Overland Flow into Onsite Surface Water Features

The Maw Burn is located in the north of the site and is an open channel, and limited section of culvert, within the Phase B & C boundary. The Maw Burn is then culverted before outfalling into the North Sea. The Cow Gut is located in the south of the wider site and predominantly within the Phase A boundary and outfalls to the River Blyth.

During enabling works, any materials at surface will be potentially exposed to overland flow run off, all of which shall be directed to either the Maw Burn, Cow Gut or proposed ponds. To break this potential pathway burnt shale material cannot be placed at surface.

As described in Section 4.2, the proposed permanent development shall comprise a combination of hard surfacing and soft landscaping. Any hard surfacing placed over the burnt shale will act as a physical barrier, preventing direct exposure between rainfall/surface water and waste materials and will be designed to channel overland flow into the site drainage system. This barrier inherently prohibits the possibility of contaminants within burnt shale migrating via overland flow as water is unable to infiltrate and mobilise potential contaminants. Similarly, topsoil quality is prescribed within the Remediation Strategy, mitigating the risk of contaminants within burnt shale migrating through overland flow. Areas of soft landscaping shall comprise a minimum of 300mm of clean materials as specified within the Remediation Strategy. Residual risks to surface waters via overland flow are transient in construction only prior to the completion of drainage works prior to placement of burnt shale materials.

5.1.2 Lateral / Vertical Leaching to On-Site Surface Water Features via Groundwater

As discussed in Section 2.9.2, localised shallow perched water is present in the Made Ground. It does not appear to be a continuous waterbody and therefore lateral migration will be limited; however, perched water could act as a pathway for contaminant migration in proximity to surface water receptors. As the water features on site are partially unlined, contaminants may migrate directly to the Maw Burn or Cow Gut via infiltration through the Made Ground.

During the enabling works phase, exposed burnt shale could be subject to infiltration from rainfall, creating a potential pathway for contaminant leaching to perched groundwater within the Made Ground and subsequently to nearby surface water features. To remove this potential contaminant linkage, burnt shale shall only be placed beneath the lowest recorded bed level of each water feature (refer to Section 2.8), except where the pathway is already interrupted by the presence of impermeable Till. This will ensure that burnt shale remains hydraulically isolated from the surface water features and will prevent the migration of leachable contaminants to the Maw Burn and Cow Gut.

The permanent state of the site shall include predominantly hard external surfaces which will further inhibit the leaching of contaminants to perched groundwater and subsequent migration to identified surface water bodies. Where areas of soft landscaping are proposed, burnt shale shall not be placed within the upper 300mm (as discussed in Section 4.7). The specified cover system will provide an additional barrier to infiltration and minimise the potential for rainfall to mobilise any potential contaminants from the underlying burnt shale.

5.1.2.1 Consideration of Site-Specific Assessment

The Remedial Targets Methodology (RTM) was initially considered as a means of assessing the potential for contaminants to migrate laterally/vertically to on-site surface water bodies. However, application of the model would require a number of highly uncertain assumptions that cannot currently be constrained by the available site data. In particular several potential placement scenarios exist across the site and the flux of the discontinuous perched aquifer cannot be characterised homogenously in its current state or predicted in the post-enabling works state. Whilst a

conservative assessment could assume a maximum source thickness of up to 6m, a 10m distance to compliance points (surface waters), a fully saturated zone, and hydraulic continuity between the burnt shale and surface water bodies, these assumptions are not supported by the observed site conditions and are likely overly conservative. Groundwater monitoring indicates the presence of a discontinuous perched water body above the Till with no clearly defined hydraulic gradient or preferential flow direction. A further limitation is the inability to robustly quantify groundwater recharge or baseflow to the underlying aquifer, which represents a key input to the RTM calculations. Consequently, any modelling outputs would be driven predominantly by generic and highly conservative assumptions rather than site-specific evidence. On this basis, the RTM is not considered to provide a reliable or representative assessment of the potential impacts of contaminants on surface water receptors via lateral/ vertical migration to surface water bodies, and its use for this purpose is therefore not considered appropriate. As such a full hydrogeological risk assessment is not considered to be required.

5.1.3 Outfall from On-site Surface Water Features to Off-site Surface Water Features

The Maw Burn and Cow Gut currently act as preferential pathways to off-site surface waters (North Sea and River Blyth). There is a possibility that a contaminant linkage will continue to exist between the placed burnt shale and off-site surface water features via entry to on-site surface water features. This pathway cannot be severed unless the lateral / vertical leaching to on-site surface water features (Section 5.1.2) is mitigated.

A conservative calculation has been undertaken to quantify the dilution factor of peak discharge rates from the Cow Gut to the Blyth Estuary:

$$DF = \frac{Q_{receiving}}{Q_{contaminated\ discharge}}$$

The dilution factor (DF) is calculated to be approximately 7.8, resulting in a dilution of approximately 87% and significantly reducing impact to off-site surface waters. The substantial water exchange volumes of a tidal system (for the Blyth Estuary approximately 6,280,000m^3 at mean tide level, for the North Sea, significantly greater) would be expected to further reduce contaminant concentrations significantly. However, as discussed within Section 5.1.1 and 5.1.2, pathways to on-site surface water features shall be severed, thereby removing the worsening of the pollutant linkage identified between on-site surface water features and off-site surface water features.

5.1.4 Preferential Pathways from Existing Below Ground Drainage Infrastructure

As outlined in Section 4.3 all obstructions, including historical drainage systems and land drains are to be identified and removed as part of the earthworks where these intersect with any excavations. As such any burnt shale materials placed will not intersect with any land drains or other drainage infrastructure which could provide a preferential pathway to the drainage channels (and subsequent outfalls) on site.

5.1.5 Preferential Pathways from Proposed Below Ground Drainage Infrastructure

Drainage proposals outlined in Section 4.5 provide information pertaining to the formal drainage system. Catchment zones of Phase B and C shall be split between the Cow Gut, the Maw Burn and the proposed ponds. Designs are yet to be finalised for the proposed attenuation pond in the north (in place of the temporary construction car park), therefore, no Burnt Shale may be placed in this location to remove the potential for this material to be moved for a second time.

Groundwater is confined beneath the Till within the Pennine Middle Coal Measures, and perched water identified within the Made Ground material is limited and discontinuous. Furthermore, surface cover (discussed in Section 4.7) comprising hardstanding or 300mm of clean cover materials will limit recharge of groundwater, substantially reducing the mobilisation of contaminants via preferential pathways from proposed below ground drainage surrounds in the permanent case.

Burnt shale materials are likely to be placed prior to the installation of permanent drainage infrastructure. Burnt shale shall be placed beneath drainage infrastructure and below the maximum depth / minimum base elevation of the on-site surface water features identified as discussed in the section above to mitigate any potential pathways. This is anticipated

to be sufficient in severing pathways via proposed below ground drainage infrastructure and is therefore considered not to represent a plausible contamination risk.

5.1.6 Vertical migration of groundwater to underlying aquifer

Once the development is in its site end use, effective recharge to the ground is likely to be negligible based on the applied surface cover. Groundwater monitoring has proven that a continuous confined groundwater body lies within the Pennine Middle Coal Measures (Secondary Aquifer). The geology of the site indicates that approximately 20 – 30m of superficial deposits (Till) lie between the burnt shale (identified potential source of contamination) and the aquifer. Till material is described to be predominantly a clay, and contaminant migration to the bedrock aquifer will be restricted by the significant thickness of relatively impermeable soils (as validated by permeability testing).

As discussed in Section 4.6, piles are likely to terminate in the Till (in line with the piling schedule presented in the GDR, Reference 21). This ensures that no preferential pathways are introduced between the burnt shale and the underlying Secondary A Aquifer. Consequently, the risk of contaminant migration via vertical flow is effectively mitigated. If the pile design changes at a later date, a foundation works risk assessment may be required to determine potential risks to groundwater once the placement locations of burnt shale have been confirmed.

This contaminant linkage therefore does not require further analysis, and the groundwater is removed as a potential receptor to contamination. It is noted that groundwater risks were also not included within the Arcadis Conceptual Site Model (Appendix A).

5.2 Burnt Shale (Source) Properties

As the conceptual site model outlined in this section is only in relation to deposit for recovery activities, the only potential source of contamination considered is burnt shale. No other materials are proposed to be recovered under an Environmental Permit.

Analysis to date has been undertaken in respect to leachability, combustibility and sulphates, alongside more general contamination testing in relation to the site's previous uses and non-water receptors outlined in the conceptual site model presented by Arcadis and accepted for discharge of the relevant planning application (Reference 29).

The burnt shale material has a low-risk typical chemical signature consistent with other Made Ground units identified on site and therefore has not been determined to be exceptional material in the context of the Remediation Strategy prepared for the site and accepted for planning (Reference 24). All materials on site have been assessed by Arcadis in the GQRA for the site and, with the exception of TPH hot spots, have been found to be of a low risk to the environment and human health. Suitability criteria and the frequency of testing for placed material are defined in the Detailed Remediation Strategy (Reference 24).

5.2.1 Leachate Testing

Chemical testing has been undertaken on samples of burnt shale from both the Rolton and Arcadis investigations and the stockpiles sampled during Phase A enabling works comprised twenty-two soil leachate samples on a 10:1 ratio. Concentrations above freshwater and saltwater EQS threshold criteria were recorded for determinants including Cadmium, Copper, Lead, Mercury, Nickel, Zinc and Fluoranthene, a summary of exceeding concentrations is presented in **Error! Reference source not found.** below. It should be noted that the limit of detection that the laboratory was able to provide for Fluoranthene and Benzo(a)pyrene were both 0.01μg/l (above EQS threshold criteria). As a result, concentrations reported as below detection (BD) (<0.01 μg/l) cannot be confirmed as being below the relevant threshold, creating uncertainty in the assessment. The analytical sensitivity is therefore insufficient to conclusively demonstrate compliance with the applicable standards, and therefore the results are interpreted with caution.

It should be noted that samples have not been compared against DWS criteria. This is because no plausible pathway exists between the burnt shale and the groundwater within the Pennine Middle Coal Measures (detailed in Section 5.1.6).

Within the table below, recorded exceedances are within six (saltwater) / nine (freshwater) samples of the 22 tested.

Test	EQS Threshold Value			Number of Samples	Range	Number of Exceedances	
	Saltwater	Freshwater				Saltwater	Freshwater
Metals							
Cadmium, Dissolved	0.20	0.09	µg/l	22	BD to 8.02	3	5
Copper, Dissolved	2.64	1.00	µg/l	22	BD to 3.31	1	6
Lead, Dissolved	1.30	1.20	µg/l	22	BD to 5.2	2	2
Mercury, Dissolved	0.07	0.07	µg/l	22	BD to 0.76	1	1
Nickel, Dissolved	8.60	4.00	µg/l	22	BD to 52.7	1	1
Zinc, Dissolved	7.90	10.90	µg/l	22	BD to 952	2	1
PAHs							
Fluoranthene	0.00630	0.00630	µg/l	22	BD to 0.23	2	2

Table 5-1: Summary of Elevated Leachate Contamination Testing against EQS Criteria

Of the elevated concentrations identified above, the following were also encountered within surface water samples taken in July 2026:

- Cadmium
- Copper
- Nickel
- Zinc
- Fluoranthene

The common occurrence of these determinants in burnt shale leachate samples and surface water samples indicates that burnt shale represents a potential source. However, the available data does not establish source attribution, particularly as previous monitoring identified higher concentrations at some upgradient locations.

No elevated concentrations of Lead or Mercury were recorded within any of the surface water samples collected, suggesting that although these metals exist within the burnt shale on site, they are not reaching the receptor (surface waters). Metals are generally slow to mobilise, and some dispersal may have occurred prior to reaching surface waters.

5.2.2 Metal Bioavailability Assessment

Elevated Nickel, Copper and Zinc were encountered both within leachate samples and surface water samples taken (Section 2.8.1) when compared to EQS Freshwater thresholds. EQS values derived for these metals in surface water are based on the assumed concentration of the contaminant that is bioavailable in the water course. Site specific bioavailability can be determined for these contaminants by assessing the physio-chemical properties of the receiving watercourse using the Metal Bioavailability Assessment Tool (M-BAT), published by the Water Framework Directive – United Kingdom Technical Advisory Group (WFD-UKTAG). The River Blyth and North Sea have not been included within this assessment as both are considered to be saline and the M-BAT is not appropriate.

For each surface water receptor, the average and median concentrations of key characteristics were calculated using samples considered representative of that receptor based on the hydrological connectivity of the site. For example, only samples collected from the Maw Burn were used to derive values for the Maw Burn.

Surface Water	pH[a]	Dissolved Organic Carbon[b] (mg/l)	Calcium[c] (mg/l)
Cow Gut	7.7	7.9	90
Maw Burn	7.4	6.6	90

[a]Average pH values derived from water samples collected in 2024 and 2025 (Reference 22)

[b]Median Dissolved Organic Carbon values from water samples collected in 2026 (Section 2.8.1)

[c]Based on a conservative estimate for water with a hardness range of 200 – 250 (CaCO3).

Table 5-2: Calculated Values for M-BAT Assessment

The results of the M-BAT assessment with respect to Nickel, Copper and Zinc are presented within Table 5-3 and Table 5-4, based on the chemistry of the most sensitive receiving water body identified.

Test	Calculated PNEC Value - worst case (ug/l)	Number of Leachate Samples	Range (µg/l)	Number of Exceedances above PNEC	Location
Copper	19.9	22	BD to 3.31	0	-
Nickel	13.9	22	BD to 52.7	1	BSSP S9
Zinc	27.3	22	BD to 952	1	BSSP S9

Table 5-3: Calculated PNEC Values for Leachable Copper, Nickel and Zinc

Test	Calculated PNEC Value (ug/l)	Number of Water Samples	Range (µg/l)	Number of Exceedances	Location
Copper	19.9	18	1.45 to 23.19	2	SW-11, RBOF
Nickel	13.9	18	2.14 to 7.07	0	-
Zinc	27.3	18	38.36 to 139.6	12	All

Table 5-4: Calculated PNEC Values for Copper, Nickel and Zinc (Surface Water)

No exceedances of the calculated PNEC for Copper (19.9 µg/l) were recorded in leachate samples. Two concentrations within surface water were elevated at the River Blyth outfall, however, based on the leachate values, the burnt shale is not considered to be the source contributing to this. Copper is therefore not considered to present a significant risk to freshwater receptors.

While an elevated leachable concentration of Nickel was detected in one sample, concentrations within freshwater samples remained below the relevant PNEC of 13.9 µg/l. On this basis, Nickel is not considered likely to adversely impact on-site surface water receptors.

Exceedances of the relevant PNEC for Zinc remain prevalent within the surface water dataset. Zinc therefore continues to be identified as a contaminant of concern with respect to surface water receptors.

It should be noted that previous water sampling and testing undertaken by both Arcadis and Cundall in 2024 and 2025 indicated that concentrations appeared higher upgradient than downgradient within the Cow Gut and Maw Burn. This suggests that a level of contamination exists within the watercourses based on off-site sources and there may be other factors contributing to the overall quality of these surface waters.

5.2.3 Contaminants of Concern

Contaminants of concern are identified as follows:

- Zinc
- Fluoranthene

These contaminants are to be of concern in relation to freshwater receptors (Cow Gut and Maw Burn). The following factors have been considered when assessing Zinc and Fluoranthene in relation to off-site surface water receptors:

- Zinc and Fluoranthene are preferentially sediment bound and therefore likely to attach to suspended sediments rather than remaining in a dissolved state. SuDS Ponds on site shall slow flow, providing a greater opportunity for particles to settle and adsorb to sediments (noting that this does not completely inhibit migration of contaminants).
- Based on the size of the receiving water bodies, dilution and dispersion is likely to significantly reduce concentrations within the water close to the point of outfall (see Section 2.8 and 5.1.3).
- Contaminants that enter estuaries are typically dispersed through tidal mixing and freshwater – seawater exchange.

- Should identified contaminants reach off site water bodies (River Blyth / North Sea) in acceptable concentrations to the on site surface water courses, the substantial water exchange volumes of a tidal system, combined with natural dilution and dispersion processes, would be expected to reduce contaminant concentrations and consequently lower the residual environmental risk to acceptable levels.

5.2.4 Waste Classification

It is prohibited to reuse any materials that would be classed as Hazardous under WM3 as part of an Environmental Permit. Preliminary Waste Classification of all materials encountered was undertaken by Arcadis as part of the GQRA submitted for the scheme (Reference 29). Fifteen samples of materials described as burnt shale were analysed using HazWasteOnline™ software to provide a preliminary classification. The majority of samples returned a non-hazardous classification, with only one sample being classified as Hazardous. The sample returning a Hazardous classification was from TP107 at 1.3m bgl (outwith the Phase B boundary) and was classified as hazardous due to cross-contamination with a known hydrocarbon hotspot rather than the inherent properties of the burnt shale material. Material this sample is representative of has since been removed as part of the Phase A enabling works.

Waste Acceptance Criteria (WAC) testing was undertaken on four samples of burnt shale material. One sample did not exceed the limits for inert soils and therefore has a likely classification of inert. Two burnt shale samples were recorded to exceed the inert limits (total organic carbon, leachable sulphate and leachable fluoride) and therefore have a non-hazardous classification. One sample from TP107, within the known hydrocarbon hot spot, was classified as Hazardous based on the observed cross contamination, WAC did not record concentrations above the non-hazardous threshold. Based on the above the relevant waste code for the proposed waste to be recovered as part of the permit will be 17 05 04 (soils and stones not containing hazardous substances).

Although Cundall recognise that the number of samples utilised in the preliminary waste assessment are low for the volume of burnt shale materials anticipated (equivalent to approximately 1 in 1,350m^3), additional testing to ensure chemical suitability of materials placed as part of the site works is mandated as part of the Remediation Strategy (Reference 24) and records will be provided in the Remediation Verification report. No chemical treatment of the burnt shale materials are proposed prior to use, current characteristics as defined in the GQRA (Reference 29) and within this report will not change.

5.2.5 Consideration of Burnt Shale as a Source of Contamination

Based on the above properties, burnt shale cannot be discounted as a source of contamination that may impact identified Controlled Waters receptors. Instead, mitigation measures should focus on removing the contaminant migration pathways such that no complete source–pathway–receptor linkage remains within the CSM. As such a full hydrogeological risk assessment is not considered to be required.

5.3 Placement Constraints

In the absence of proving the burnt shale is not a source of contamination, suitable environmental protection will be provided via the breaking of potential pollutant pathways. To ensure that all potential pollutant linkages are effectively broken, as described in Section 5.1, and that the relevant legislation is followed the placement of materials shall meet the following requirements:

- Burnt shale shall meet the leachable suitability testing requirements outlined in Appendix C (tested at a frequency of 1 in 500m^3).
- Where burnt shale is unsuitable based on leachability criteria, placement shall occur either below the lowest surface water feature on site (3.1m AOD) or within areas where the material is surrounded by low-permeability cohesive deposits.
- No unsuitable burnt shale shall be placed below the temporary car park in the north of the site as this area may be regraded following completion of construction.
- Burnt shale shall not be interleaved with other materials placed under the MMP on site.

- Material placement shall be undertaken in accordance with all applicable specifications (Earthworks Specification and Remediation Strategy) and the criteria set out in the following chapter.

5.4 Conceptual Site Model

Based on the elimination of identified pathways via the constraints imposed (as set out in Section 5.3 and discussed in the following section), no residual pollutant linkages exist in relation to the recovery operation.

It has therefore been qualitatively demonstrated that no further geoenvironmental risk assessment, including Hydrogeological Risk Assessments are required based on the absence of residual pollutant linkages within the Conceptual Site Model in both the permanent and temporary case.

6.0

Waste Compliance and Aftercare

6.0 Waste Compliance and Aftercare

6.1 Waste Compliance

Preliminary Waste Classification of the burnt shale was undertaken by Arcadis, indicating that if not reused on site burnt shale materials will likely be removed as inert or non-hazardous (noting that additional testing to ensure chemical suitability of materials placed as part of the site works is mandated as part of the Remediation Strategy, to which the burnt shale must be compliant). Based on the above the relevant waste code for the proposed waste to be recovered as part of the permit will be 17 05 04 (soils and stones not containing hazardous substances).

As no pollutant linkages have been identified for the site in relation to controlled waters, ongoing monitoring is not required as no pollution control measures are deemed necessary above and beyond those identified for general fill materials on site and placement restrictions set out in Section 5.3. Control measures for general fill on site is outlined within the Remediation and Earthworks Strategies (References 24 and 27).

6.1.1 Geotechnical Requirements

Cundall has prepared an earthworks specification for the enabling works area, which is intended to be covered by the Environmental Permit (Reference 4). The specification outlines the requirements for acceptability and testing etc. of earthworks material and applies to all materials on site, including burnt shale materials.

Based on the characteristics of the burnt shale outlined in the Earthworks Strategy and summarised within the Waste Recovery Plan (References 1 and 4, respectively), the majority of the samples obtained indicate the material is generally a well graded and may meet the criteria of a general fill, although an element of screening may be required occasionally when anthropogenic materials are encountered.

There is requirement for field compaction trials to be undertaken on all material types, inclusive of the burnt shale. During compaction trials and / or earthworks, if it is observed that oversize particles within the burnt shale do not break down as expected to become compliant with the relevant grading requirements, these will revert to an unsuitable material. This is not anticipated based on the data obtained during the previous ground investigations at the site but is a measure in place to ensure only suitable materials are recovered. burnt shale materials in their current condition are generally considered to be geotechnically suitable for reuse during earthworks and do not require treatment.

6.1.2 Chemical Requirements

The suitability criteria for general fill materials for a commercial end use and soil organic matter (SOM) of 1% has been outlined within the Remediation Strategy (Reference 24). Site won material is required to be tested a minimum of 6 per source or 1 per 100m^3 (whichever is greater) unless justification can be made for a reduction can be made based on a robust statistical analysis. burnt shale shall be verified following the same requirements as other site won materials and testing results shall be reviewed prior to the placement of material to confirm suitability, records will be provided in the Remediation Verification Report.

No leachate criteria have been outlined within the Remediation Strategy for Environmental Quality Standards. Leachate criteria are included in Appendix C, which is required in addition to criteria outlined in the Remediation Strategy. Leachate tests are to be undertaken at a frequency of 1 in 500m^3. Where burnt shale does not meet the criteria outlined in Appendix C, placement of the material is constrained as per Section 5.3.

6.1.3 Unsuitable Materials

Any non-compliant materials will be defined as an unsuitable material. Unsuitable materials will not be recovered as part of the environmental permit and proof of their disposal and volume will be provided at permit surrender.

6.2 Post Closure Controls (Aftercare)

Based on the above assessments there are not considered to be any post-closure controls or monitoring required for the recovery activity. The inherent nature of the scheme design mitigates any residual pollutant linkages between the burnt shale materials and the identified controlled waters receptors. There is no mining legacy on site that would require any subsidence monitoring.

As outlined in the preceding section chemical and physical suitability will be confirmed prior to placement and any unsuitable material will be disposed of. At permit surrender verification of the chemical and geotechnical suitability will be provided, alongside material movement records.

7.0

Conclusions and Future Assessments

7.0 Conclusions and Future Assessments

7.1 Conclusions

This report presents a comprehensive characterisation of the Site, including the site history, topography, geological and hydrogeological ground model. As the deposit for recovery activity is limited to the burnt shale material, therefore, this is the only potential source of contamination considered within this report at the request of the Environment Agency in pre-application correspondence. Burnt shale materials were not identified to pose an exceptional risk to the site in the Arcadis GQRA (Reference 29). No other materials are proposed to be recovered under an Environmental Permit.

The potential source of contamination—burnt shale—has been assessed in terms of its current location, estimated volume, and chemical composition. Environmental sensitivities and key receptors have been evaluated in regard to Controlled Waters identifying the following receptors: Maw Burn, Cow Gut, Blyth Estuary, the North Sea, and groundwater within the Secondary A Aquifer (Pennine Middle Coal Measures). Engineering design considerations have been outlined, covering proposed earthworks, site drainage infrastructure, and final elevation levels.

A contaminant linkage assessment was undertaken using the "*source–pathway–receptor"* model in accordance with LCRM (2023). Based on a detailed review of the site's geology, hydrogeology, and development proposals, it was concluded that no plausible pathway exists between the identified source (burnt shale) and the receptors (Surface Waters) as all possible pathways have been sufficiently mitigated by identifying placement constraints within the site.

7.2 Future Assessments

As outlined in the Environment Agency Guidance (Landfill operators: environmental permits - What to include in your environmental setting and site design report - Guidance - GOV.UK). consideration is to be given to the requirement for additional risk assessments when recovering waste materials. The requirement for additional risk assessments is summarised and outlined below.

7.2.1 Impacts on Amenity Value

Materials under the permitted recovery activities are to be excavated and placed to an engineering specification as part of a wider programme of earthworks. No treatment of the burnt shale material such as screening or crushing is proposed as part of the works and receptors are limited based on the extent of the wider Cambois Campus site and its generally industrial setting (see Table 2-1).

Construction controls are already in place as part of the Construction Environmental Management Plan and the burnt shale materials are not considered to pose any risks over and above other materials on site with regards to dust, bioaerosols, visible emissions or litter. Following the recovery activity, once the site is developed for the proposed end use, burnt shale materials will be capped and no pathway to any amenity receptors exists. A specific Amenity Value assessment is not considered to be required.

7.2.2 Gas Migration

As outlined in Section 2.7 a site-specific ground gas assessment concluding a Characteristic Situation 1 for the site has been approved by the local authority as part of the planning process. As burnt shale material is not high in organic materials that could be subject to degradation that would be a source of ground gas there is no additional ground gas risk posed by the placement of these materials. No ground gas risk beyond that already undertaken is considered to be required.

7.2.3 Hydrogeological Risk Assessment

As concluded by this report, no residual pollutant linkage to the controlled waters environment from the burnt shale materials to any of the identified receptors in the temporary (construction) and/or permanent case exists. A Hydrogeological Risk Assessment is therefore not required to support the Permit Application.

Drawings

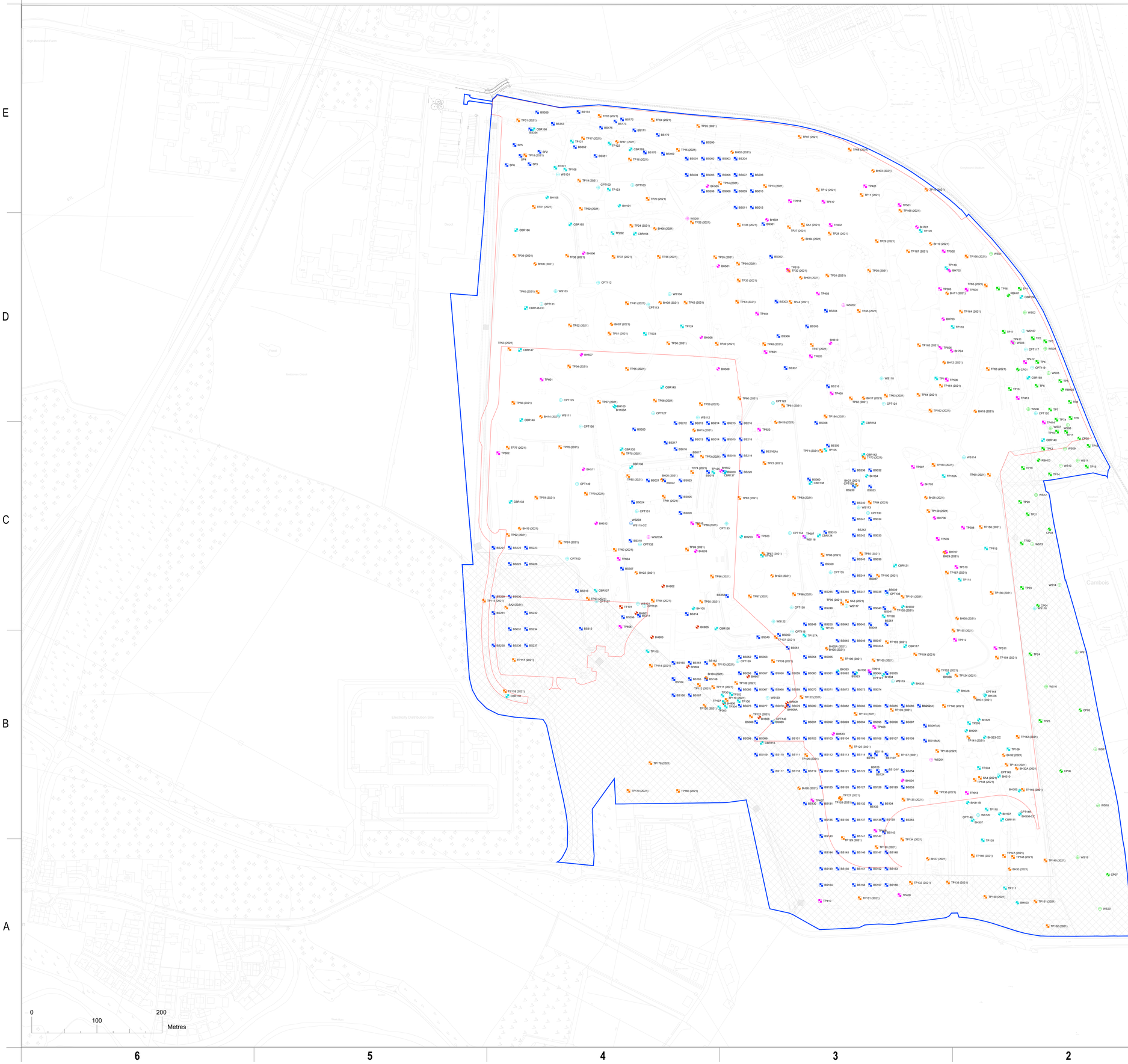
Drawings

GBR1-ENA2-CDL-STE-XX-DR-B-1001 Combined Exploratory Hole Location Plan

GBR1-DCZZ-CDL-STE-XX-DR-B-0013 Geological Cross Sections

GBR1-ENA2-CDL-STE-XX-DR-B-1003 Water Level Contour Plan and Sections, Enabling Works Phase B & C

GBR1-ENA2-CDL-STE-XX-DR-B-1004 Approximate Location and Thickness of Burnt Shale, Enabling Works Phase B & C



A0

OWNER

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SHEET NOTES

1. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH ALL RELEVANT ENGINEERS, ARCHITECTS AND OTHER CONSULTANTS DOCUMENTATION.
2. SOME DRAWINGS MAY NEED TO BE PRINTED IN COLOUR TO PRESERVE INFORMATION INDICATED IN COLOUR ON THE DRAWINGS.
3. DO NOT SCALE. WORK TO FIGURED DIMENSIONS ONLY.
4. ALL DIMENSIONS STATED IN mm UNLESS OTHERWISE NOTED

REFERENCES

1. Arcadis (January 2025) Ground Investigation Factual Report - Stage 2. Report reference: 30226657-AUK-XX-XX-RP-ZZ-0015-01.
2. Arcadis (October 2024) Ground Investigation Factual Report - Stage 1. Report reference: 30226657-AUK-XX-XX-RP-ZZ-0007-01.
3. 1st Horizon (21st October 2024). Blyth Topographical & Utility Survey Sheet Overview. Drawing reference: A-B11243-01.
4. Rolton Group Limited (11th August 2022). Burnt Shale Trial Pit Investigations for Former Coal Stocking Yards, Cambois. Report reference: PHX-RGL-XX-XX-RP-G-000014A Rev S2-P03.
5. Rolton Group Limited (1st April 2022). Phase 1 & Preliminary Geo-Environmental Summary for Rail Head Land, Cambois. Report reference: PHX-RGL-XX-XX-RP-G-000014 Rev S2-P02.
6. Rolton Group Limited (14th May 2021). Geotechnical and Geo-Environmental Report for Former Coal Stocking Yards, Cambois. Report reference: PHX-RGL-XX-XX-RP-G-000010 Rev S2-P01.
7. The ground investigations undertaken by Dunelm during the Phase A Enabling Works are not included in this drawing.

Rev	Description	Date	Ch'd	Apr'd
V01	ENABLING WORKS - RIBA STAGE 4	03/07/26		

DRAWING ISSUES

KEY PLAN



PROJECT

GBR1 Cambois

Former Blyth Power Station
Coal Stocking Yard, Cambois,
Northumberland

DWG. TITLE

Combined Exploratory Hole Location Plan,
Enabling Works Phase B & C

PROJECT NO:

1043152

DWG. NO:

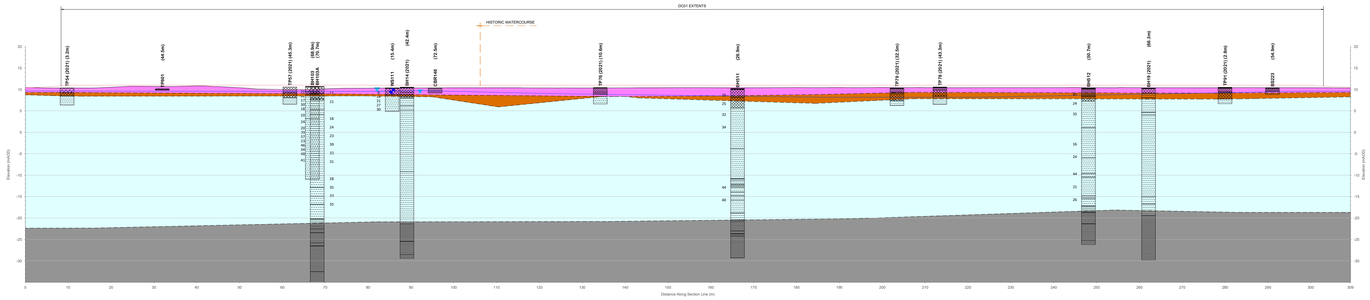
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ISSUED FOR REVIEW	1:2000	V01

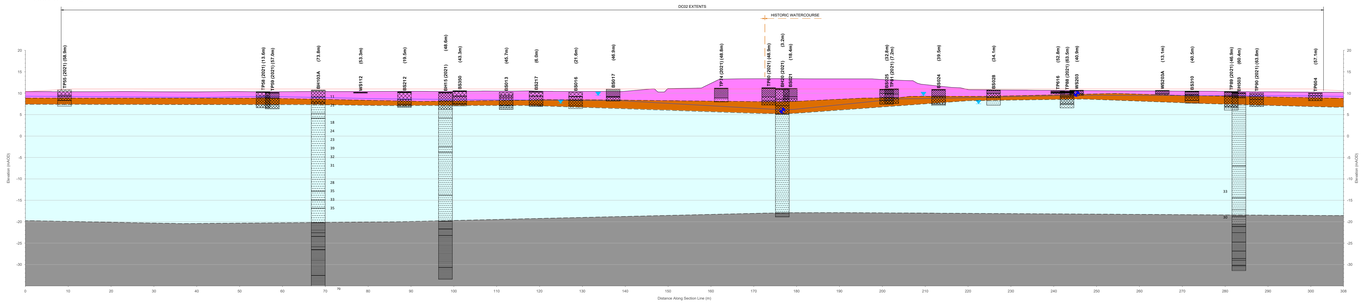
SECTIONS LEGEND

- Sections - Existing Ground
- Sections - Proposed Ground
- Sections - Inferred Geological Boundary
- Sections - Water Level
- Water Strike
- Highest Monitored Water Level
- (Xm) Offset from Section Line
- 14 SPT N Value
- Granular Made Ground
- Cohesive Made Ground
- Alluvium
- Till
- Pennine Middle Coal Measures

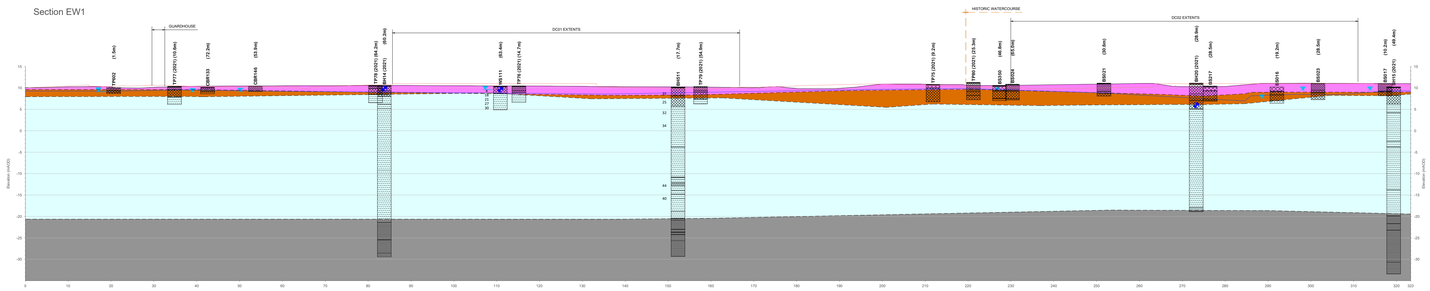
Section NS1

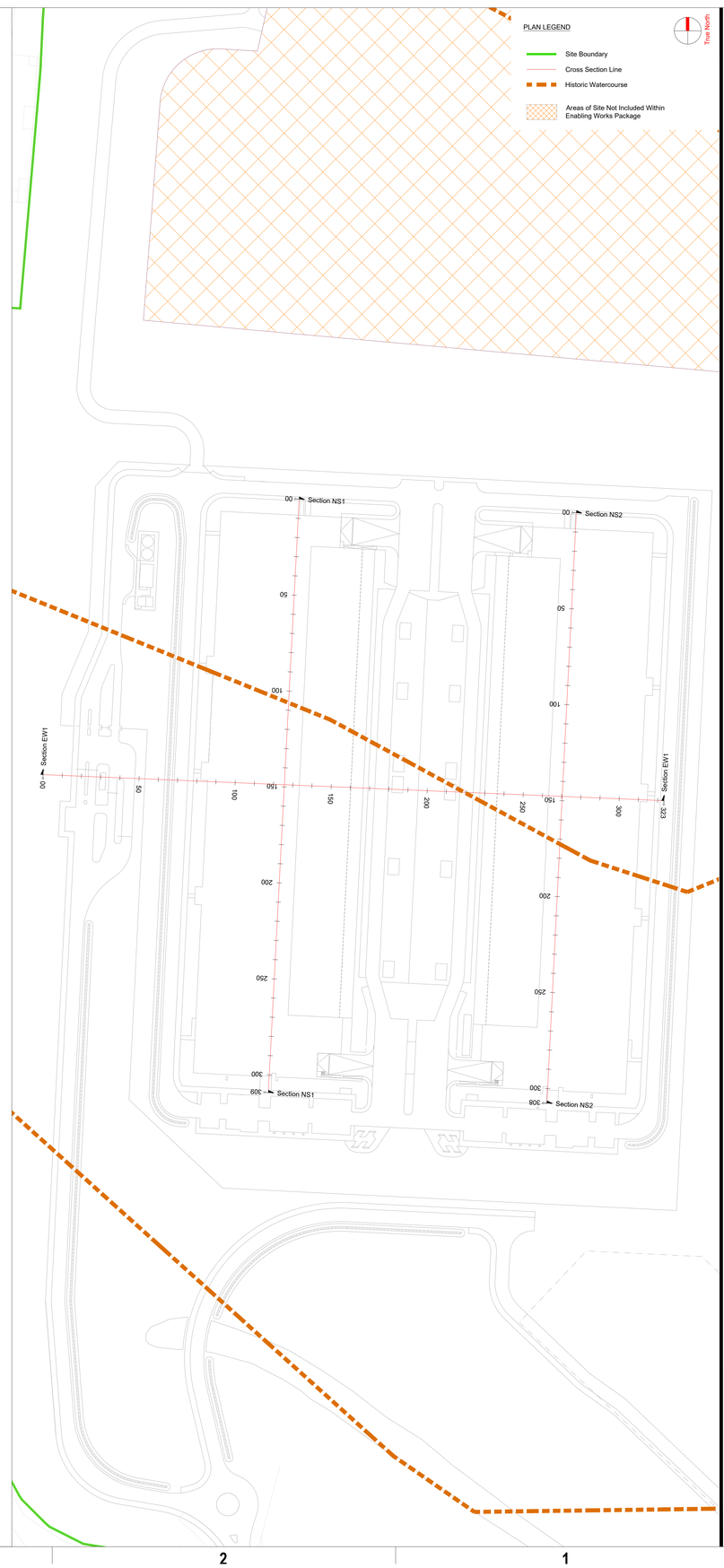


Section NS2



Section EW1





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4. ALL DIMENSIONS STATED IN mm UNLESS OTHERWISE NOTED

The ground conditions illustrated represent the site prior to the commencement of Phase A enabling works.

These sections are to be reviewed in conjunction with the Cundall (2025), Ground Conditions Report, reference GBR1-DCZZ-CDL-STE-XX-RP-B-0-0013.

Although alluvium deposits are not shown on the section drawings, their location and extent can be found in Cundall (2025), Contour Plan - Top of Till, reference GBR1-DCZZ-CDL-STE-XX-DR-B-0010.

In the location of historic watercourses, localised and deeper made ground deposits may be present.

Rev	Description	Date	Chk'd	Apr'd
V01	RIBA3 ISSUE	29/08/25	RDavidson	RDavidson

DRAWING ISSUES

KEY PLAN



PROJECT

PROJECT WIND

Former Blyth Power Station
Coal Stocking Yard, Cambois,
Northumberland

DWG. TITLE

GEOLOGICAL CROSS SECTIONS

PROJECT NO:

1043152

DWG. NO:

GBR1-DCZZ-CDL-STE-XX-DR-B-0013

STATUS:

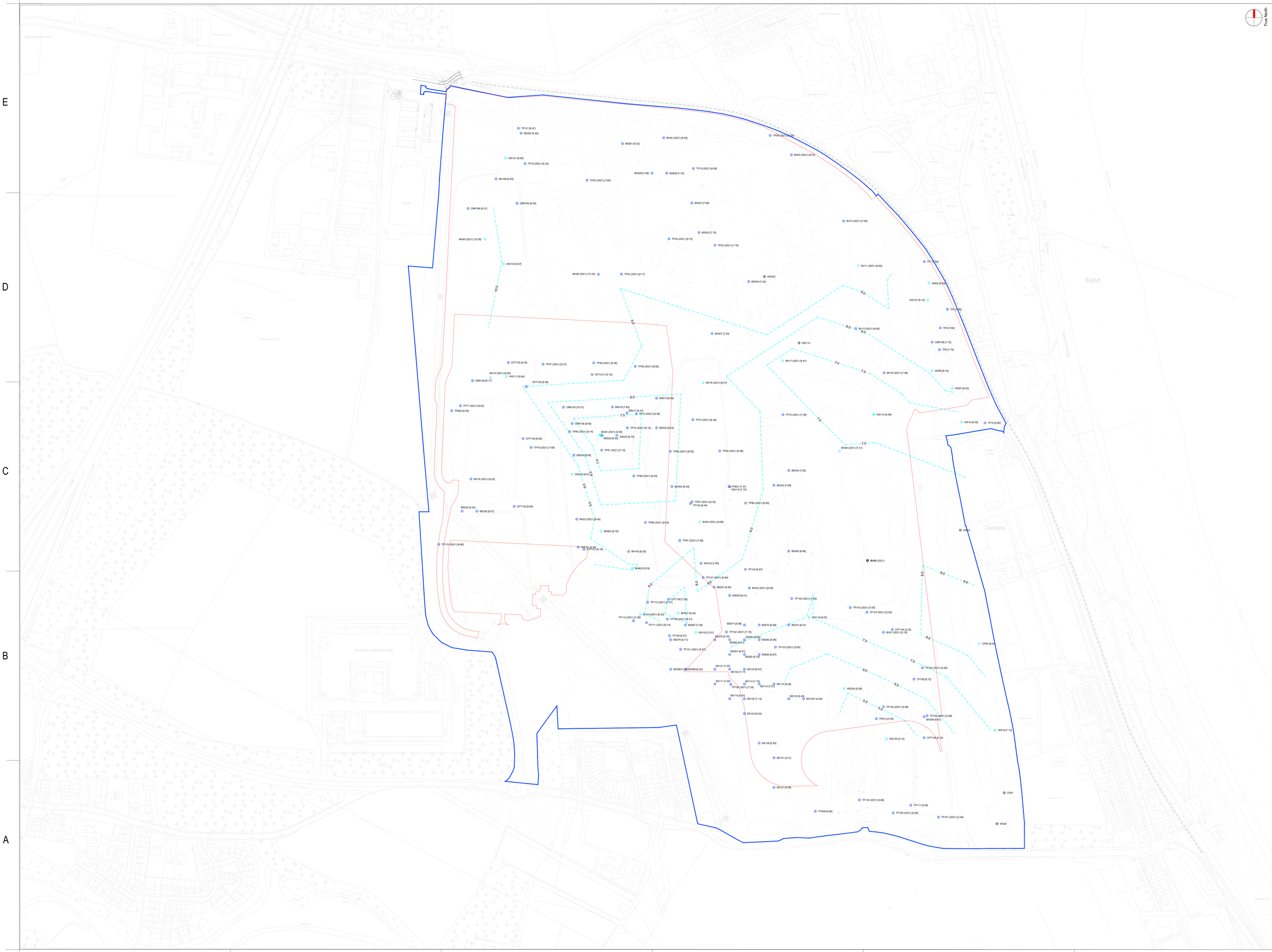
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3. DO NOT SCALE. WORK TO FIGURED DIMENSIONS ONLY.
4. ALL DIMENSIONS STATED IN mm UNLESS OTHERWISE NOTED

Legend

- Phase B Working Boundary
- Wider Site Application Boundary
- Contour Plan - Water Level in mAOD
- Monitored Water Position [m AOD]
- Water Strike Position [m AOD]
- Monitoring well recorded as dry

NOTES

Water levels shown on this drawing are based on the following data:

- Data from water monitoring installations (where the response zones were within Made Ground or within Made Ground / Till deposits). This plan shows the shallowest monitored level.
- Water strikes have been considered to be the shallowest water level (after rise).
- BH29 and BH30 have been discounted due to water being within PFA stockpiles.

Water data is discussed within the Cundall Ground Conditions Summary Report (GBR1-ENA2-CDL-STE-XX-RP-B-1002) which also details the ground investigations which have been used to determine water levels.

Rev	Description	Date	Chk'd	Ap'd
V01	ENABLING WORKS - RIBA STAGE 4	03/07/26	IC Checked	W Verified

DRAWING ISSUES

KEY PLAN



PROJECT

GBR1 Cambois

Former Blyth Power Station
Coal Stocking Yard, Cambois,
Northumberland

DWG. TITLE

Water Level Contour Plan,
Enabling Works Phase B & C

PROJECT NO:

1043152

DWG. NO:

GBR1-ENA2-CDL-STE-XX-DR-B-1003

STATUS:	SCALE @ A0:	REV
ISSUED FOR REVIEW	1:2500	V01


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CONSTRUCTION PHASE CAR PARKING
SUBSTATION
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Sand
Cambois
Electricity Distribution Site
Depot
Pond
Watercress Centre
High Brockland Farm
Ashwood Gardens
Greyhound Stadium
Cambois Crescent
Bothal Avenue
Bothal Close
Bothal Drive
Bothal Gardens
Bothal Grove
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Appendices

Appendices

Appendix A CSM

Source	Pathway	Receptor	Potential Risk
Contaminated soils associated with previous use as a coal stocking yard, railway lines and sidings, fuel storage, workshops and factories, infilled ground.	Dermal Contact and Ingestion Particulate / Fibre Inhalation Vapour Inhalation	Human health – Future commercial end-users	**Low - Moderate**
	Soil Leaching / Aqueous Migration	Surface water – Maw Burn and Cow Gut	**Low**
PFA stockpiles	Dermal contact and ingestion Particulate / fibre inhalation Vapour inhalation	Human health – Future commercial end-users	**Low**
	Soil Leaching / Aqueous Migration	Surface water – Maw Burn and Cow Gut	**Low**
Ground gas – Made Ground, organic alluvial soils and coal seams	Vapour inhalation	Human health – Future commercial end-users	**Low**
	Structural damage owing to explosion of combustible gas	Buildings / enclosed structures	**Low**
Contaminated perched groundwater	Dermal contact Vapour inhalation	Human health – Future commercial end-users	**Low**
	Soil Leaching / Aqueous Migration	Surface water – Maw Burn and Cow Gut	**Low**
Chemically aggressive Made Ground, natural soils, rock and groundwater	Direct contact with buried concrete (e.g. piled foundations)	Buildings / structures	**Moderate**
Contaminated soil – phytotoxic contaminants	Vegetation root uptake	Future landscaping	**Moderate**
Organic contamination	Impacts to drinking water quality	Future water supply pipes	**Moderate**

Table A-7-1: Table 8-1 from Arcadis GQRA (Reference 29)

Appendix B Summary of Surface Water Sampling Results

Appendices: Results of Surface Water Contamination Testing against EQS Freshwater Criteria

Test	Threshold Value		No. of Samples	Range	No. of Exceedances	Location
Metals						
Boron, Dissolved	2000	ug/l	18	60.3 to 2217	1	RBOF
Cadmium, Dissolved	0.25	ug/l	18	BD to 0.33	2	SW-07
Chromium III	4.7	ug/l	18	1.85 to 8.56	8	All but SW-07
Copper	1.00	ug/l	18	1.89 to 23.19	18	All
Nickel, Dissolved	4.00	ug/l	18	2.14 to 7.07	10	All but RBOF
Zinc, Dissolved	10.90	ug/l	18	38.36 to 139.6	18	All
PAHs						
Fluoranthene	0.00630	ug/l	18	BD to 0.4	11	All
Benzo(a)pyrene	0.00017	ug/l	18	BD to 0.22	6	SW-07, SW-08, SW-11

Appendices: Results of Surface Water Contamination Testing against EQS Saltwater Criteria

Test	Threshold Value		No. of Samples	Range	No. of Exceedances	Location
Metals						
Cadmium, Dissolved	0.20	ug/l	18	BD to 0.33	2	SW-07
Copper	2.64	ug/l	18	1.45 to 23.19	12	All but SW-07
Zinc, Dissolved	7.90	ug/l	18	38.36 to 139.6	18	All
PAHs						
Fluoranthene	0.00630	ug/l	18	BD to 0.4	11	All
Benzo(a)pyrene	0.00017	ug/l	18	BD to 0.22	6	SW-07, SW-08, SW-11

Appendix C Leachate Criteria

Test	Threshold Value		Source
Metals			
Arsenic, Dissolved	50.00	ug/l	EQS Freshwater
Boron, Dissolved	2000.00	ug/l	EQS Freshwater
Cadmium, Dissolved	0.25	ug/l	EQS Freshwater
Chromium III	4.70	ug/l	EQS Freshwater
Chromium VI	3.40	ug/l	EQS Freshwater
Copper	19.90	ug/l	Calculated PNEC
Lead, Dissolved	1.20	ug/l	EQS Freshwater
Mercury, Dissolved	0.07	ug/l	EQS Freshwater
Nickel, Dissolved	13.90	ug/l	Calculated PNEC
Vanadium, Dissolved	60.00	ug/l	EQS Freshwater
Zinc, Dissolved	27.30	ug/l	Calculated PNEC
PAHs			
Naphthalene	2.00000	ug/l	EQS Freshwater
Anthracene	0.10000	ug/l	EQS Freshwater
Fluoranthene	0.00630*	ug/l	EQS Freshwater
Benzo(a)pyrene	0.00017*	ug/l	EQS Freshwater

*MCERTS accreditation not widely available for Fluoranthene and Benzo(a)pyrene below 0.01 ug/l, therefore, a non-MCERTS accredited test may be required.

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