Transport, Environment & Design

Bovey Basin Ball Clay Workings – Central Area

Environmental Setting and Site Design Report

August 2025

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Document Control Sheet

Project Reference:	HCE1205
Project Title:	Bovey Basin Ball Clay Workings – Central Area
Document Subject:	Environmental Setting and Site Design Report
Document Reference:	HCE1205.ESSD.REV2
Author:	Jamie Howourth
Checked:	Alex Large
Client:	Sibelco UK Ltd
Initial Issue Date:	02 April 2025

Revision of Issue

Revision	Revision Author	Checked	Date
Rev 1	Jamie Howourth	Alex Large	07-Aug-2025
Rev 2	Jamie Howourth	Alex Large	21-Aug-2025

Distribution

Organisation	Contact	Issue Format & No. of Copies *	Date
Sibelco UK Ltd	Ben Uphill	**D1**	02-Apr-2025
Sibelco UK Ltd	Ben Uphill	**D1**	07-Aug-2025
Sibelco UK Ltd	Ben Uphill	**D1**	21-Aug-2025

** D denotes digital copy / P denotes paper copy*

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Revision	Author	Description	Date

1. Introduction

1.1 Commission

1.1.1 Horizon Consulting Engineers Limited (Horizon) was commissioned by Sibelco UK Ltd (Sibelco or "the Client" or "the Operator") to prepare an Environmental Setting and Site Design Report (ESSD) for the Bovey Basin Ball Clay Workings (Central Area) in support of an Environmental Permit import and place restoration soils at the Site.

1.1.2 This report specifically relates to the Central Area Quarries, located within the wider Bovey Basin Ball Clay Workings. It is proposed to incorporate the re-use of mine waste material (i.e "overburden") and imported waste soils (subsoil and topsoil) into one permit rather than to have a separate mine waste facility permit and deposit for recovery permit.

1.2 Background & Planning Permission

1.2.1 A consolidated planning permission has recently been granted by Devon County Council (DCC) for the continued winning and working of permitted mineral reserves, associated development, and progressive restoration of the Site (DCC/4344/2023). Selected drawings showing the restoration plans are included in Appendix A of the CSM report[1]

1.2.2 The Site, for the purposes of defining the permit boundary, extends circa 219 Ha and comprises five operational areas including the three Central Area Quarries (Southacre, White Pit and John Acres Lane), Preston Manor Works and overburden tipping areas (Heathfield Tip, Rixey Park Tip, White Pit Tip and Binney Tip). A plan showing these areas is included on Drawing ST18876-011 in Appendix A of the CSM.

1.2.3 A natural by-product of the extraction activities is overburden and non-target mineral or 'interburden'. Whilst the appropriate blending of materials seeks to minimise the amount of material wastage, due to the sedimentary nature of the deposit, some materials do not meet the stringent specifications required and as such the overburden and interburden is currently deposited within the Rixey Park, White Pit and Heathfield Tips which sit within the Central Area application boundary. Restoration cannot be completed exclusively from overburden and interburden. Additional material is needed to provide a suitable substrate for the establishment of new habitats.

1.3 Site Classification: Deposit for Recovery

1.3.1 It was agreed on 20 August 2024 (EA Ref: EPR/SP3427SW/P001) that the importation of material to complete the approved restoration would be deemed a recovery activity. The Waste Recovery Plan (WRP)[2] was agreed for the wider Bovey Basin Ball Clay Workings area however this permit application primarily relates to the first phase of restoration (The Central Area Quarries), as shown in **Drawing 1205.101** in Appendix B of the CSM.

1.3.2 The waste recovery activities that will be caried out at the Site as defined under Annex II of the Waste Framework Directive can be summarised as follows:

- R5: Recycling or reclamation of other inorganic materials'

[1] Horizon (April 2025). Bovey Basin Ball Clay Workings. Conceptual Site Model. Ref: HCE1205.CSM.Rev2
[2] Horizon (March 2024). Bovey Basin Ball Clay Workings. Waste Recovery Plan. Ref: HCE1205.WRP.Rev2

- R10: Land treatment resulting in benefit to agriculture or ecological improvement; and
- R13: Storage of wastes pending any of the operations numbered R1 and R12 (excluding temporary storage, pending collection, on the site where it is produced).

1.4 Report Structure

1.4.1 This ESSD report sets out the details of the conceptual model developed for the Site along with proposed installation design, control measures and monitoring based on the Site's environmental setting. The remainder of this report is structured as follows:

- Section 2 sets out the Site details and some of the key features of the Site's environmental setting and site design.
- Section 3 summarises the output of the CSM and the subsequent risk assessments undertaken
- Section 4 summarises the proposed volume of material to be used;
- Section 5 presents details of the compliance points;
- Section 6 outlines the proposed essential and technical precautions to be adopted during the restoration works;
- Section 7 provides details of monitoring points; and
- Section 8 provides details of post closure controls;

2. Site Details

2.1 Site Location & Access

2.1.1 The Site is located at Bovey Basin Ball Clay Workings accessed via the Preston Manor Processing Area, Lower Preston, Preston, Kingsteignton, TQ12 3PR

2.1.2 A plan showing the site location (including permit boundary) is in Appendix A of the CSM report[1] (**Drawing 1205.101**).

2.1.3 The Site is accessed off Lower Preston Road. Site traffic for the purposes of the environmental permit (site visitors and lorries carrying imported waste) will use existing traffic management to enter the Preston Manor Processing Area which includes the Site offices, parking and holding area for imported soil. A one-way system will be in operation with routing for lorries carrying imported material shown on the Site Infrastructure Plan (**Drawing 1205.106** in **Appendix A**).

2.2 Site Context

2.2.1 The Site is located to the north-west of Kingsteignton and is bound by:

- The B3193 (now referred to as "Clay Pits Way"), Heathfield Landfill and Higher Sandygate to the east;
- Preston Village, Kingsteignton and Denistone Quarry to the south;
- The River Teign with agricultural land beyond to the west; and
- The River Teign with Clay Lane Quarry beyond to the north

2.2.2 The topography of the Site ranges from -46 meters Above Ordnance Datum (m AOD) at the lowest elevation across the three quarries (South Acre Quarry) to 57 m AOD at the east of the Site at Heathfield Tip (adjacent to White Pit Quarry). The general gradient across the Site slopes from the east to south-west.

2.3 Summary of Sensitive Receptors

2.3.1 Potential receptors identified within the vicinity of the Site, that may be affected by the works, have been summarised in the table below and shown on **Drawing 1205.102** (Appendix B of the CSM[1]):

Receptor	Location	Details
Surface Water		
River Teign	Located adjacent to the west of the Site	The River Teign has numerous footpaths that run along the river along the boundary of the Site.
Ugbrooke Stream	Adjacent to the south of the Site	Stream runs north-east to south-west along the southern boundary of the Site.
Abbrook Ponds	35 m south	The ponds are used for fishing and are fed by the Ugbrooke Stream.
Stover Canal	200 m west	Not actively used as a canal. Managed by Stover Canal Heritage Trust.
Nature & Heritage Conservation		
Proposed restoration habitats and existing deciduous woodland	On-Site	Proposed habitats include wildflower meadows, woodland and grassland.

John Acres Strip pCWS	On-Site	Medium-low diversity grassland grading to high quality grassland at the northern tip.
Lappathorn Cope UWS	On-Site	Broadleaved woodland.
Bovey/Teign Confluence CWS	Adjacent to the west	Riverine tree cover, tall herb communities, exposed riverine sediment, beetle, bat and otter interest;
Abrook Pond and Woodland CWS	Adjacent to the south	Pond with broadleaved woodland, wet woodland, scrub and small area of unimproved neutral grassland
Ugbrooke Stream Meadow pCWS	Adjacent to the south-east	Wet woodland and species-rich wet meadow
Southacre Clay Pits SSSI	On-Site	Geological importance for interpreting conditions of the late Palaeogene within the Bovey Basin. Not accessible to the general public.
Stover Trail (Stover Canal)	200 m west	Footpath and cycleway that runs along historic canal
Brocks Farm SSSI	700 m west	Biological importance as this herb-rich field supports a grassland community
Chudleigh Knighton Heath SSSI	930 m north-west	Biological importance as it is an example of lowland Devon heathland.
Stover Park SSSI	0.96 km west	200-year-old lake, rich in invertebrates and rare species.
Stover LNR	1.3 km west	Local nature reserve for wildlife and heritage trails.
Chudleigh Caves and Woods SSSI & SAC	1.2 km northeast	Limestone cave system and semi-natural woodland.
General Public, Buildings and Community		
Allotments	Adjacent to the south	Adjacent to the Abbrook fishing ponds to the south of the Site.
Abrook Farm Sports Centre	50 m south	A sports hub consisting of a bowls pitch, football pitches and buildings is present to the south.
Residential - Preston village	150 m south-west	Small village of Preston with farmsteads is located in close proximity to the Site.
Residential – Kingsteignton town	250 m south	Main residential properties are located approximately 250 m south of the Site.
Residential – Sandygate village	250 m south-east	The village of Sandygate is located in close proximity to the Site.
Kingsteignton Swimming Pool	325 m south	Outdoor swimming pool
Five Lanes Playing Fields	350 m south	Football pitches
Teign School	500 m south	Secondary school grounds with playing fields
Nursery / Kingsteignton School	550 m south	Early years and primary school with outdoor play areas.

Table 2-1: Sensitive Receptors

2.4 Adjacent Waste Management Activities

2.4.1 With reference to the CSM report, the Heathfield Landfill Site (Household, Commercial and Industrial Waste Transfer Station) is located adjacent to the east. Fosterville Ltd also operate a recycling facility which includes non-hazardous waste physical treatment (adjacent to the east). Gilpin Scrap Metal Ltd operate a scrap metal recycling facility and asbestos waste transfer station located 500 m north-east of the Site.

2.4.2 The Site also benefits from a Standard Rules permit (SR 2009 No.8 - management of inert wastes and unpolluted soil at mines and quarries) located in the south of the Site. The boundary associated with the Standard Rules permit is shown on the Site Location Plan included in Appendix A of the Conceptual Site Model[1] report (**Drawing 1205.101**). The permitted activities include managing sand tailings associated with extractive waste from the quarry.

2.5 Site Boundary & Security

2.5.1 Lorries carrying imported waste soils will use the existing weighbridge for periodical checks on weight however loads are to be predominantly managed by counting delivery tickets.

2.5.2 The permitted area boundary will continue to be kept secure throughout the works to prevent unauthorised access. Post and wire fencing and, in some areas, dense vegetation and steep slopes, ensures a high level of security around the Site and deterrence to trespassers.

2.5.3 The boundary is inspected at least once per week by the Operator to check it is intact. CCTV security cameras are installed at the Site, with associated movement sensors. A third-party security firm is retained to respond out-of-hours to any potential security breaches.

2.5.4 The processing area supports the main quarry operations. Various plant and equipment are stored across the buildings present. Doors and windows are reinforced against vandalism as necessary. A padlocked gate is present at the entrance to the Site.

2.5.5 All site visitors are required to sign the visitors book on entry, and again on exiting the Site. The exception is drivers of vehicles depositing waste at the Site who will be required to remain in their vehicles at all times.

2.6 Climate Change

2.6.1 The overarching aim of the works is to restore the quarry by creating a growing medium for new habitats to establish. The approved restoration scheme includes the planting of new trees which will have a net positive impact on the environment with respect to carbon sequestration and reducing flood risk. Greenhouse gases will be added to the environment from vehicles transporting imported waste soils along with subsequent plant that will place the material however this would still be required if the destination for the waste soils was elsewhere (i.e an alternative landfill or deposit for recovery site). On this basis climate change is not considered to be negatively affected by the restoration proposals.

2.6.2 The impact of Climate Change on the restoration works is low and has been assessed as part of the planning application in documents such as the Flood Risk Assessment[3].

[3] Wardell Armstrong (2023) Bovey Basin Ball Clay Works Central Area. Flood Risk Assessment. Ref: ST18876

3. Conceptual Site Model

3.1 Conceptual Site Model

3.1.1 A standalone CSM report[1] has been developed for this project with reference to guidance on GOV.UK.

3.1.2 The CSM report[1] includes details relating to:

- Historical activities at the Site;
- The approved restoration works including proposed waste types, phasing plus outline management measures and technical controls;
- Precipitation data (i.e., rainfall record);
- Local surface water features;
- Geological and hydrogeological setting;
- Man-made pathways that may be affected by the restoration works; and
- Receptors in the vicinity of the Site including amenity, habitats and natural heritage.

3.1.3 Data and discussion presented in the CSM report[1] is generally not repeated in this ESSD report. It is assumed the reader of this ESSD report has read and is familiar with the CSM report[1].

3.1.4 The aim of the CSM report[1] is to evaluate the scope of specific risk assessments that are required as part of the permit. For example, with respect to this permit application, two reports that have been specifically produced are a Hydrogeological Risk Assessment (HRA)[4] and a Stability Risk Assessment (SRA)[5]. A summary of the output of the CSM report is included in **Table 3-1** below:

Report	Key Receptors	Discussion
Reports Produced as an Output of the CSM		
Hydrogeological Risk Assessment (HRA)	River Teign Ugbrooke Stream	The River Teign and the Ugbrooke Stream are located adjacent to the Site and have associated discharge consents relating to quarry surface water management. The Site is also underlain by a Secondary A Aquifer
Stability Risk Assessment (SRA)	Habitats Amenity	The main risk from any slope stability risk would be in relation to the proposed habitats. Long term stability will need to be demonstrated to ensure the proposed works do not cause adverse risk to future habitat creation.
Reports screened out at the CSM Stage		
Gas Risk Assessment	Local Residents Habitats	Given the imported material placed is to be inert and less than 2 m in thickness. A Gas Risk Assessment has not been carried out.
Amenity / Dust Management Plan	Local Residents Habitats Amenity	The main hazard associated with risks to amenity is considered to be dust. Discussion provided in Section 6 – Pollution Control Measures. Condition 16 of Planning Permission requires updated Dust Management Plan to be submitted.

Table 3-1: Summary of CSM Report Findings

3.2 Hydrogeological Risk Assessment

3.2.1 A qualitative risk screening which has been used to determine whether the development proposals represent, or potentially represent, a fundamental risk to groundwater and surface water receptors. Considerations made in the assessment are summarised below:

[4] Horizon (April 2025). Bovey Basin Ball Clay Workings. Hydrogeological Risk Assessment. Ref: HCE1205.HRA.Rev1
[5] LMCL (April 2025). Bovey Basin Ball Clay Workings. Stability Risk Assessment. Ref: 00934-250129/RSWS

- The nature of the overburden and imported material will have a low contaminant potential with strict Waste Acceptance Procedures[6] adopted.
- The underlying geology is a Secondary A Aquifer however the cohesive nature of the soils and topography will inhibit vertical migration of contaminants through the unsaturated zone with the predominant pathway being via overland flow directly to surface water receptors or via discharge from a settlement lagoon.
- Restoration is undertaken in a phased approach which will mitigate the risk of contaminant migration once habitats have begun to establish. Existing restoration has already been carried out at the toe of some existing slopes which is already attenuating run-off impacts from overland flow.

3.2.2 Strict Waste Acceptance Procedures[6] are proposed which will limit the potential for elevated concentrations within the inert waste and reduce the risk of rogue loads.

3.2.3 A Surface Water Management Plan was submitted as part of the planning application and provides details of how surface water is to be managed on-Site. The details of the approved Surface Water Management Plan provide additional mitigation for the risk to controlled waters from the placement of imported waste soils.

3.3 Stability Risk Assessment

3.3.1 An SRA[5] was carried out by Land and Minerals Consulting Ltd (LMCL) associated with the proposed works. The stability analysis undertaken as part of the assessment demonstrated that adequate Factors of Safety for long-term stability will be attained for the proposed restoration provided all slopes are constructed to a design of 1v in 3h or shallower.

[6] Horizon (April 2025). Bovey Basin Ball Clay Workings. Waste Acceptance Procedures. Ref: HCE1205.WAP.Rev1

4. Volumes

4.1 Imported Material

4.1.1 From the restoration plan provided in **Appendix C**, a total area for each habitat has been estimated as shown in the table below. Areas include all proposed habitats with the exception of heathland and natural regeneration areas which would likely be created without imported soil. A depth of 30 cm of topsoil and 90 cm of subsoil has been allowed for.

4.1.2 There is no specific requirement within the Planning Permission in relation to thicknesses of topsoil and subsoil however taking into account best practice guidance and Sibelco's previous experiences, these thicknesses should be sufficient in completing the approved restoration.

4.1.3 Some of the proposed habitats are assumed to have already been established and as such, soil volumes have not been accounted for in the below table. Phase 3 volumes have been excluded from the volume calculations as this area of the Site is not covered by the SRA[5]. It is proposed to vary the permit at a later date to account for the Phase 3 soils.

Proposed Habitats	**Area (m^2)**	**Total Soil Volume (m^3)**	**Total Topsoil Volume (m^3)**	**Total Subsoil Volume (m^3)**
Phase 1				
Proposed Neutral Meadow	11,328	13,594	3,398	10,195
Proposed Woodland (Closed)	2,012	2,414	604	1,811
Phase 2				
Proposed Neutral Meadow	4,084	4,901	1,225	3,676
Proposed Neutral Grassland	18,146	21,775	5,444	16,331
Proposed Pasture	63,572	76,286	19,072	57,215
Proposed Woodland (Closed)	4,450	5,340	1,335	4,005
Proposed Woodland (Open)	6,839	21,775	5,444	16,331
Total	**110,431**	**146,086**	**36,521**	**109,564**

Table 4-1: Summary of Required Volumes (First Ten Years) to Complete Restoration

4.2 Overburden and Interburden

4.2.1 The majority of the final landform will be formed from the placement of non-target mineral excavated from the quarry voids. This will comprise naturally occurring clays derived from the bedrock geology that have not met the strict quality requirements for processing. 2.2.5 It is anticipated that during the 15-year period to which the approved restoration scheme relates, the annual tipping volumes are expected to comprise approximately 435,000 m^3 of overburden and interburden from the Central Area.

5. Compliance Points

5.1 Summary

5.1.1 The Surface Water Management Plan included in **Appendix B** shows how surface water falling within the catchment of the deposition areas is controlled by only leaving via two discharge points (depending on the catchment area). These are already consented for the quarry operations.

5.1.2 Given the strict Waste Acceptance Proecdures[6] to be adopted, the proposed surface water management and low contamination potential of imported waste, no routine surface water or groundwater monitoring is proposed. Compliance with the existing discharge consents for the quarry is to continue throughout the operation of the permit therefore ad-hoc samples may be obtained to demonstrate this. Further rational is provided in the HRA[4] with pollution control measures set out in Section 6 below. Requirements of the discharge consents are provided in Section 7.

5.1.3 On the basis of the above, the existing discharge points are considered to be compliance points and are shown on the Monitoring Point Plan in **Appendix A** (**Drawing 1205.107**).

6. Pollution Control Measures

6.1 Outline Engineering Plan

6.1.1 Given the output of the HRA and SRA, no specific engineering works are required associated with the environmental permit.

6.1.2 The principal pollution control measure at the Site is strict adherence to the Waste Acceptance Procedures[6] along with limiting the potential for unauthorised waste deposition. Details of the Site are shown on the Site Infrastructure Plan in **Appendix A** (**Drawing 1205.105**). Services associated with the processing area are shown separately on **Drawing 1205.106**.

6.2 Surface Water Management

6.2.1 Operational phases of the Site where tipping is taking place are graded to encourage surface water run-off and control overland flow. Ditches will be installed along the hydraulically downgradient edge of each phase (if not already in-place), draining to on-Site settlement and storage basins.

6.2.2 Wardell Armstrong Drawings from the FRA (ST20466-001 to ST20466-003 inclusive (representing the three phases of development)) are provided in **Appendix B** and demonstrate how surface water will be managed.

6.2.3 The drawings demonstrate how areas of the Site act as a “catchment” for surface water with water draining to sumps at the bottom of voids before being pumped to settlement lagoons and then discharged under the existing licensed discharge consents. A surface water run-off volume calculation (shown on the drawings) demonstrates the required attenuation capacity required for each catchment.

6.2.4 As the restoration develops, the impacts of the surface water run-off will be reduced as growing habitats will help mitigate volumes of run-off.

6.2.5 Pumping from quarry sumps to settlement lagoons is suspended when water levels are high. Discharge rates from the settlement lagoons are restricted by rates set out within the existing discharge consents.

6.3 Amenity

6.3.1 With respect to the ongoing quarrying and restoration within the Central Area, the biggest impact to amenity use is likely to be from dust. Given the Site has a history of industry, specifically the quarrying and processing of clay, effective management practices are already in place.

6.3.2 A condition of the Planning Permission (Condition 16) for the approved works is that an up-to-date Dust Management Plan (DMP) is to be completed and agreed by the local authority. It is assumed that the updated DMP will meet the requirements of the Environment Agency associated with the Environmental Permit. An update to this report has been submitted to DCC for approval.

6.3.3 On that basis no additional control measures (i.e., over and above the existing dust management already undertaken etc) are proposed. Details of the existing dust management controls are set out within the DMP.

6.4 Incident Response & Quarantine Area

6.4.1 Any waste deemed to be unacceptable based on visual inspection following importation to the holding areas (i.e., prior to material being compacted by excavator or bulldozer at the final site of deposition) will be excavated and placed in a dedicated quarantine area. This is detailed within the WAP[6].

6.4.2 On the basis of the visual or olfactory observations (i.e., the rationale for moving material to the Quarantine area) a plan of action will be determined for the quarantined material. This may involve consultation with the EA and/or additional chemical testing of the material.

6.4.3 Should the Quarantine area become full, then the Site will cease to accept waste for deposition until such time as space is available within the Quarantine area and/or a course of action is agreed with the EA.

7. Monitoring

7.1 Weather

7.1.1 Monitoring weather conditions will be a requirement of the DMP with details recorded in the Site diary. This includes reviewing the weather forecast in advance of works, monitoring wind conditions and visual monitoring to assess if dust control measures, such as damping down exposed surfaces, are required during the works. This is to include comments along the lines of whether the source of any dust is evident, is the dust constant or intermittent, can the dust be seen to be settling on surfaces.

7.1.2 During periods of particularly inclement weather the Site Manager has the authority to pause specific operations to minimise potential for trafficking dust / mud off-Site.

7.1.3 It is not proposed to install a weather station at the Site given measurements of wind speed are less important than visual observations from the Site Manager or their nominated deputy.

7.2 Surface Water and Groundwater Monitoring

7.2.1 Regular monitoring of surface water and groundwater quality is not proposed.

7.2.2 Water abstracted from Southacre is discharged via license NRA-SW-5677 to the River Teign and water abstracted from White Pit and John Acres Lane is discharged to the Ugbrooke Stream via license NRA-SW-5678.

7.2.3 Requirements of the existing discharge consents are set out below.

- No visible signs of oil and grease.
- Contain no matter in a concentration which will cause the receiving waters to be poisonous or injurious to fish, the spawn of fish or food of fish.
- No single sample of effluent discharged shall have in excess of 250 mg/l of suspended solids for license NRA-SW-5677 and 120 mg/l for license NRA-SW-5677.

7.2.4 The locations of the discharge consent points are shown on the Monitoring Point Plan in **Appendix A**.

8. Post Closure Controls

8.1.1 The proposal is to create a suitable growing medium for the establishment of new habitats. This provides for a restoration scheme that results in a landform in keeping with the surrounding area and providing a safer and more ecologically beneficial landscape.

8.1.2 Following placement of the soil layer the Site is to be restored in accordance with the Masterplan approved in the Planning Permission (**Appendix C**).

8.1.3 Provided the material is imported as per the requirements of the Waste Acceptance Procedures[6], placed as required by the SRA[5] and this ESSD report, no post closure controls or aftercare is required for the Site.

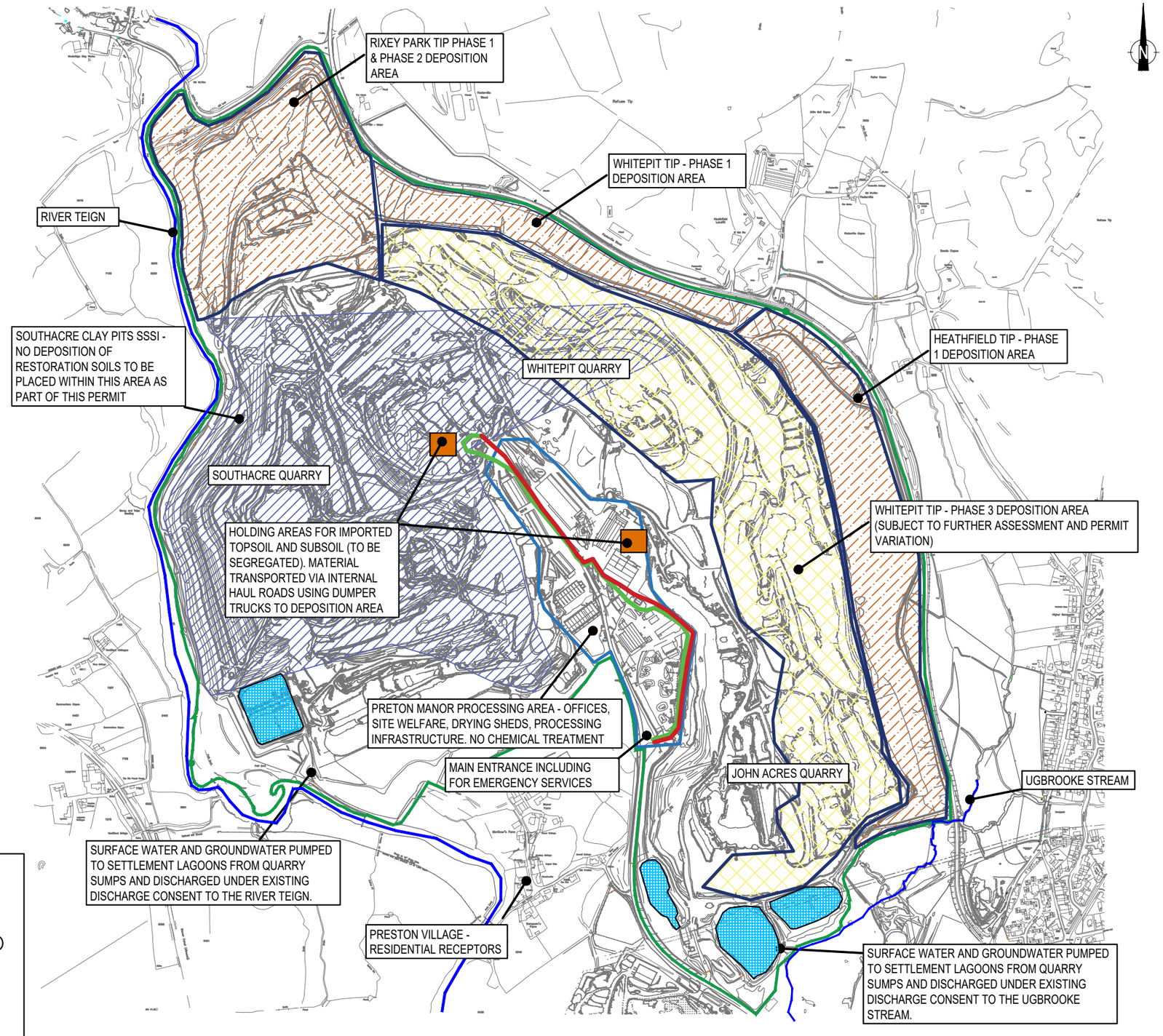
8.1.4 Aftercare of the Site will be undertaken in a phased approach for a minimum of five years post placement of the capping layer (a requirement of the Planning Permission). This is to demonstrate that the restoration scheme has met the design objectives. This will include visual observations to confirm the planting has “taken” to the restoration soils and that no movement of slopes has occurred (to be confirmed by annual topographic surveys).

8.1.5 Site completion will occur when sufficient monitoring has been undertaken to demonstrate that the Site has met the design objectives, does not pose a significant risk to the environment and the Environmental Permit can be surrendered.

Appendix A
Horizon Drawings

NOTES: GENERAL

1. SEE SURFACE WATER MANAGEMENT SHOWN IN APPENDIX A OF THE HRA (DRAWINGS ST20466-001 TO ST20466-003) FOR MORE DETAILS. FOUL WATER ASSOCIATED WITH THE PRESTON MANOR PROCESSING AREA CONNECTS WITH UNDERGROUND CESSPIT
2. DETAILS OF SERVICES ARE SHOWN ON DRAWING 1205.106. NOTE FOR THE PURPOSES OF THIS SITE INFRASTRUCTURE PLAN THERE ARE NO SERVICES PRESENT WITHIN THE AREAS DESIGNATED FOR PLACEMENT OF RESTORATION SOILS.
3. PROPOSED DEPOSITION AREAS ARE PHASE 1 AND PHASE 2. PHASE 3 DEPOSITION IS NOT SUBJECT TO THIS CURRENT PERMIT APPLICATION.
4. A SECURITY FENCE IS PRESENT AROUND THE PERIMETER OF THE PERMIT BOUNDARY. THIS IS REQUIRED AS PART OF THE ONGOING QUARRY OPERATIONS.
5. EMERGENCY SERVICES WILL ENTER THE SITE VIA LOWER PRESTON USING EXISTING HIGHWAYS INFRASTRUCTURE.
6. PRESTON MANOR PROCESSING AREA SURFACED WITH HARDSTANDING AND INCLUDES SITE WELFARE, STORAGE OF OIL AND FUELS, SPILL KITS, WATER MAINS STOP TAP, ELECTRICITY AND GAS ISOLATING VALVES.



KEY:

- PERMIT BOUNDARY (AS PER 2024 PLANNING PLANNING PERMISSION)
- DEPOSITION AREAS AS PART OF THIS PERMIT APPLICATION
- FUTURE DEPOSITION AREAS (SUBJECT TO FURTHER ASSESSMENT AND PERMIT VARIATION)
- HOLDING AREAS FOR IMPORTED RESTORATION TOPSOIL AND SUBSOIL
- SITE OF SPECIAL SCIENTIFIC INTEREST
- INBOUND TRAFFIC FOR LORRIES
- OUTBOUND TRAFFIC FOR LORRIES

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SIBELCO UK

JOB TITLE

BOVEY BASIN BALL CLAY WORKINGS
KINGSTEIGNTON

DRAWING TITLE

SITE INFRASTRUCTURE PLAN

Rev	Description	Drn	Chk	Date
				regen

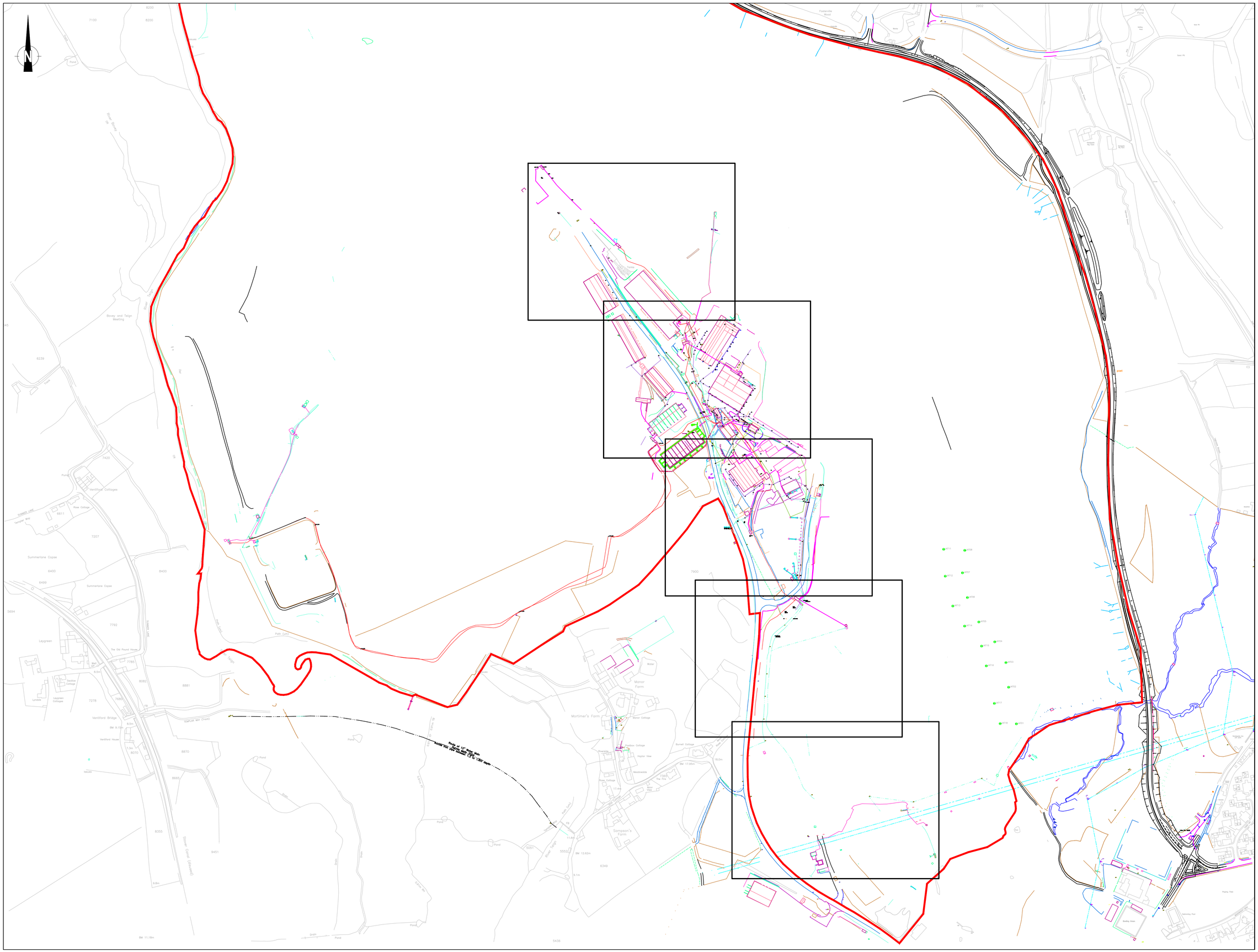
REVISIONS

Preliminary		Approval		Tender		Const.	

DRAWING STATUS

DATE	DRAWN	CHECKED
FEB '25	JH	.

DRAWING No.	REV	SCALE	
1205.105	.	1:5,000	@ A3



NOTES: GENERAL

1. DO NOT SCALE FROM THIS DRAWING
2. ALL DIMENSIONS SHOWN ARE IN METRES UNLESS STATED OTHERWISE
3. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ALL RELEVANT SCHEME DRAWINGS AND SPECIFICATIONS

KEY:

- UNDERGROUND ELECTRICITY (240 V)
- UNDERGROUND ELECTRICITY (415 V)
- UNDERGROUND ELECTRICITY (11 kV)
- UNDERGROUND TELECOMS
- GAS
- SURFACE WATER DRAINAGE
- FOUL DRAINAGE
- WATER MAINS

Rev	Description	Drn	Chk	Date
REVISIONS				

Preliminary Issue		Submitted for S104	
Planning Issue		Issued for Tender	
Submitted for S38		Issued for Construction	
Submitted for S278		As Built	
DRAWING STATUS			

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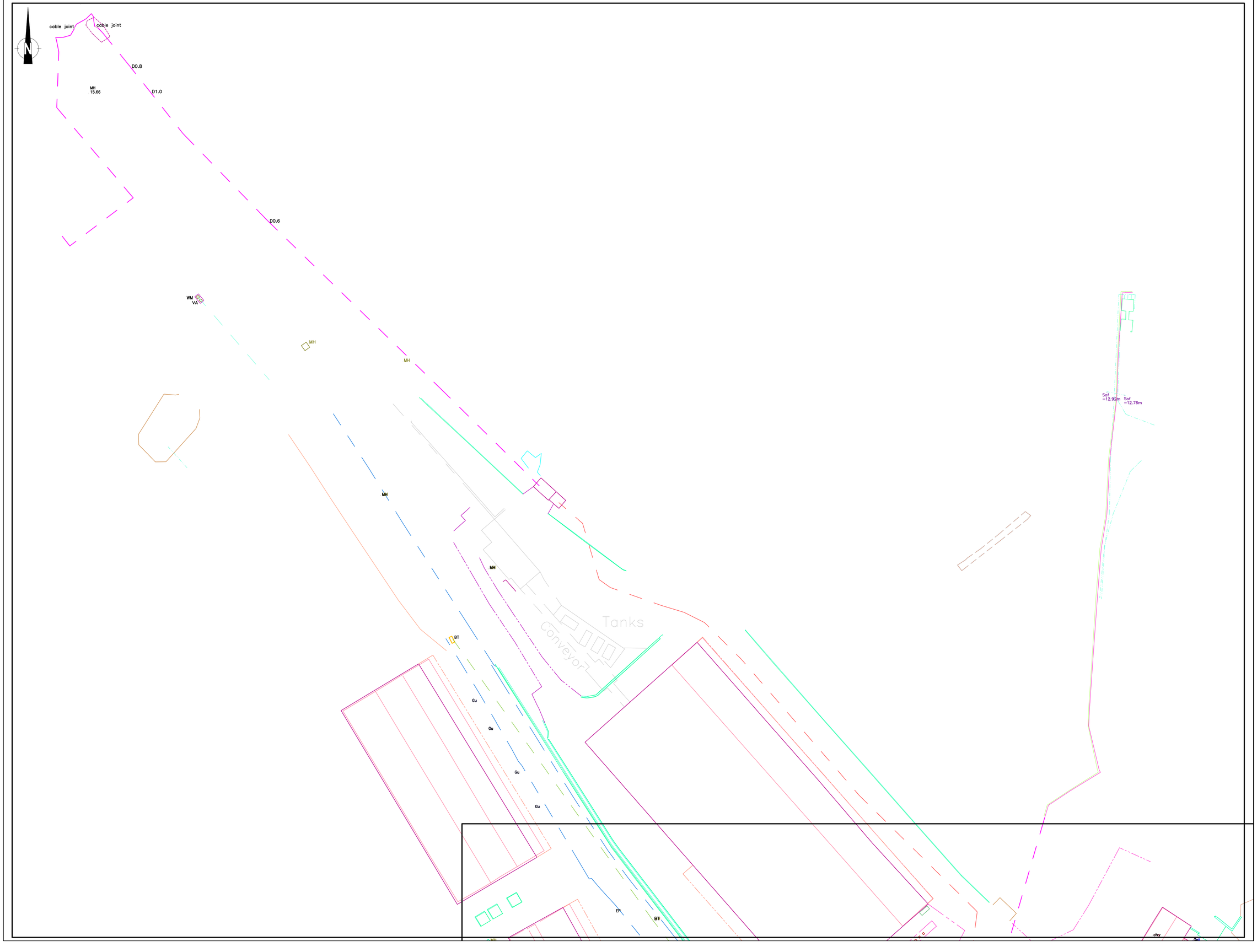
JOB TITLE
BOVEY BASIN CLAY WORKINGS
KINGSTEIGNTON

DRAWING TITLE
SERVICES
SHEET 1 OF 6

DATE	DRAWN	CHECKED
MAR '25	JH	AL

DRAWING No.	REV.	SCALE	@
1205.106A	–	NTS	A1



NOTES: GENERAL

1. DO NOT SCALE FROM THIS DRAWING
2. ALL DIMENSIONS SHOWN ARE IN METRES UNLESS STATED OTHERWISE
3. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ALL RELEVANT SCHEME DRAWINGS AND SPECIFICATIONS

KEY:

- UNDERGROUND ELECTRICITY (240 V)
- UNDERGROUND ELECTRICITY (415 V)
- UNDERGROUND ELECTRICITY (11 kV)
- UNDERGROUND TELECOMS
- GAS
- SURFACE WATER DRAINAGE
- FOUL DRAINAGE
- WATER MAINS

Rev	Description	Drn	Chk	Date
REVISIONS				

Preliminary Issue		Submitted for S104	
Planning Issue		Issued for Tender	
Submitted for S38		Issued for Construction	
Submitted for S278		As Built	

DRAWING STATUS

Horizon Consulting Engineers
The Dairy Barn, Westpoint Crt, Sidmouth Rd, Exeter EX5 1DJ
T: 01392 363364
www.horizon-ce.co.uk

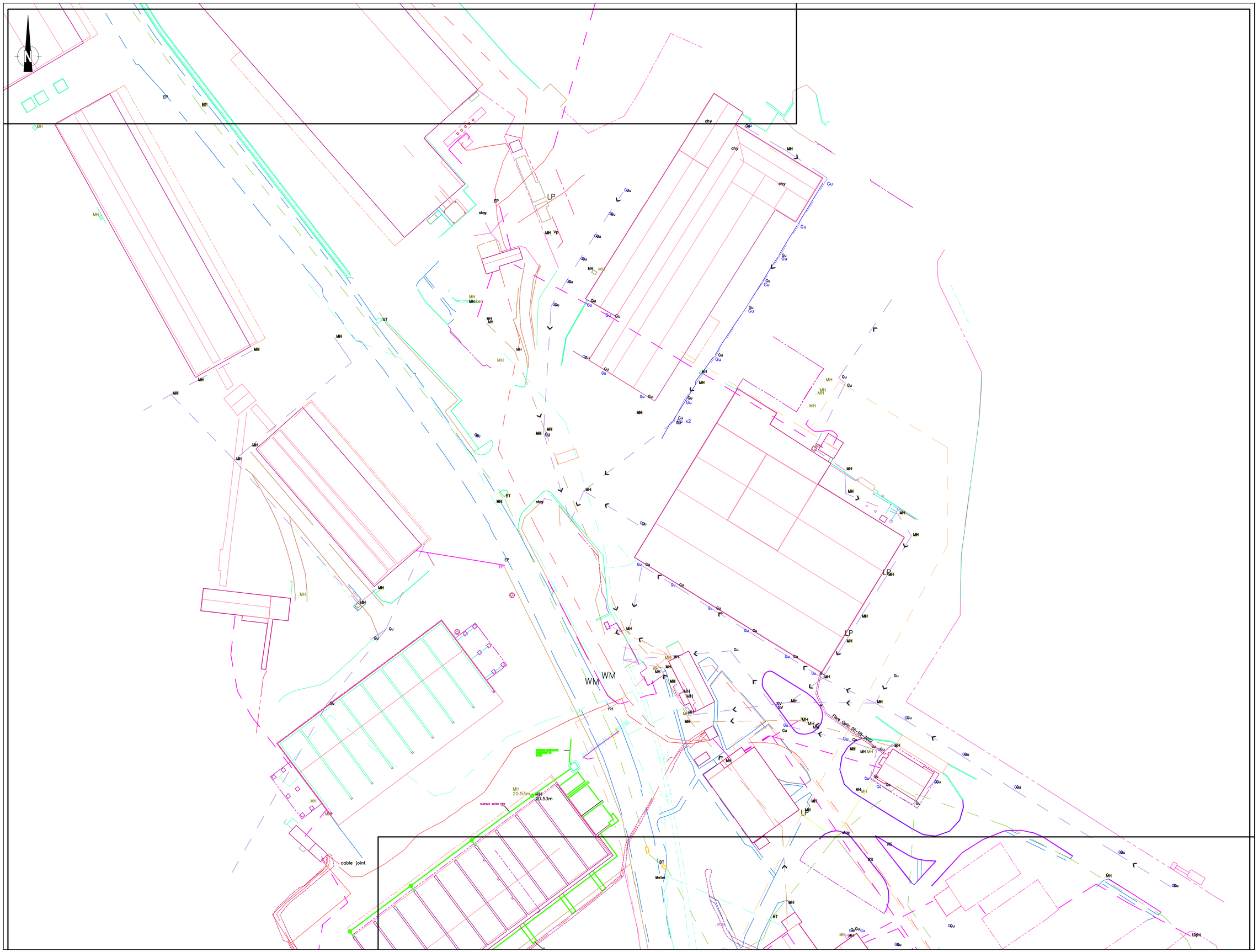
SIBELCO UK

JOB TITLE
BOVEY BASIN CLAY WORKINGS
KINSGTEIGNTON

DRAWING TITLE
SERVICES
SHEET 2 OF 6

DATE	DRAWN	CHECKED
MAR '25	JH	AL

DRAWING No.	REV	SCALE	
1205.106B	–	NTS	@ A1



NOTES: GENERAL

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Rev	Description	Drn	Chk	Date
REVISIONS				

Preliminary Issue		Submitted for S104	
Planning Issue		Issued for Tender	
Submitted for S38		Issued for Construction	
Submitted for S278		As Built	
DRAWING STATUS			

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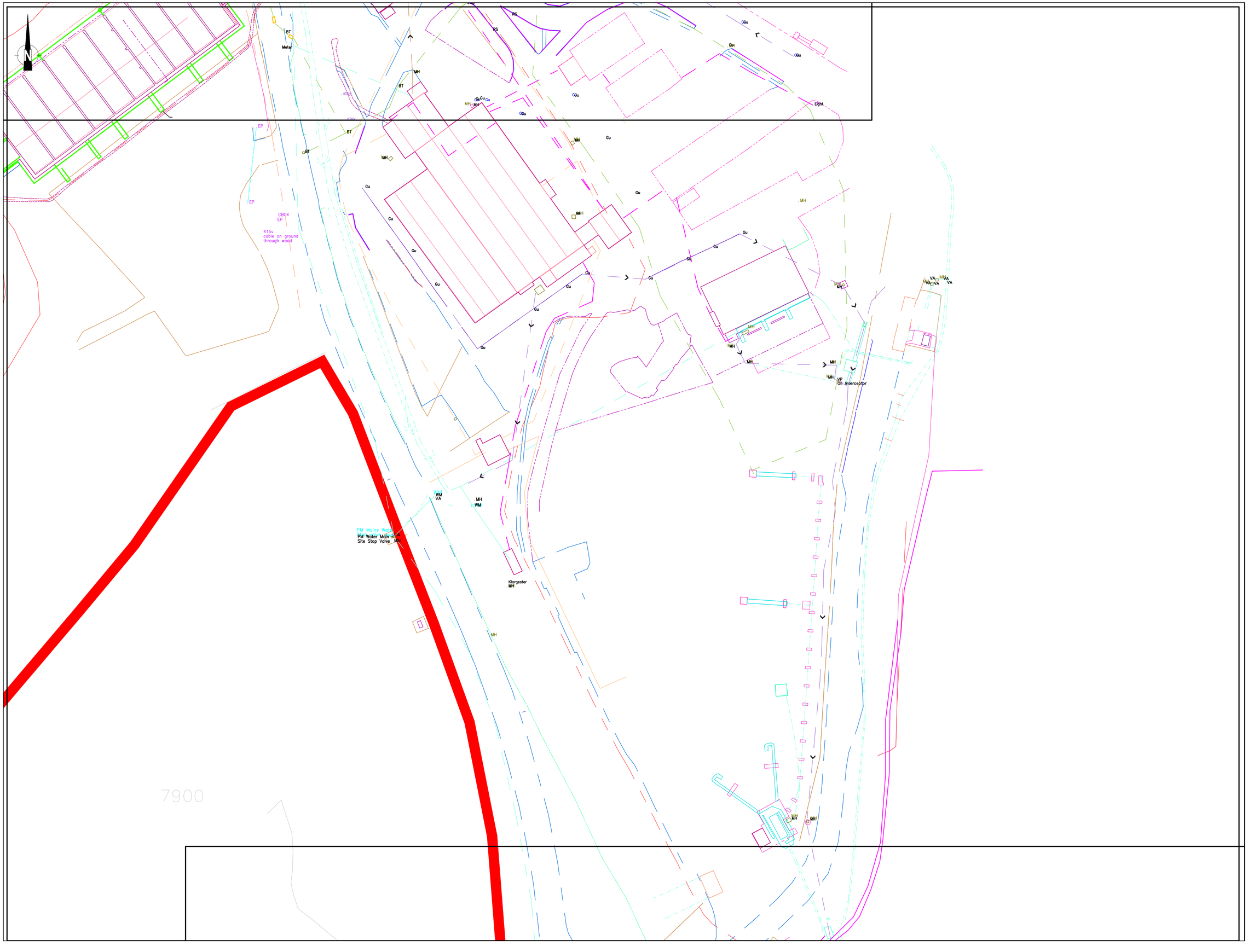
JOB TITLE
BOVEY BASIN CLAY WORKINGS
KINSGTEIGNTON

DRAWING TITLE
SERVICES
SHEET 3 OF 6

DATE	DRAWN	CHECKED
MAR '25	JH	AL

DRAWING No.	REV	SCALE	
1205.106C	–	NTS	@ A1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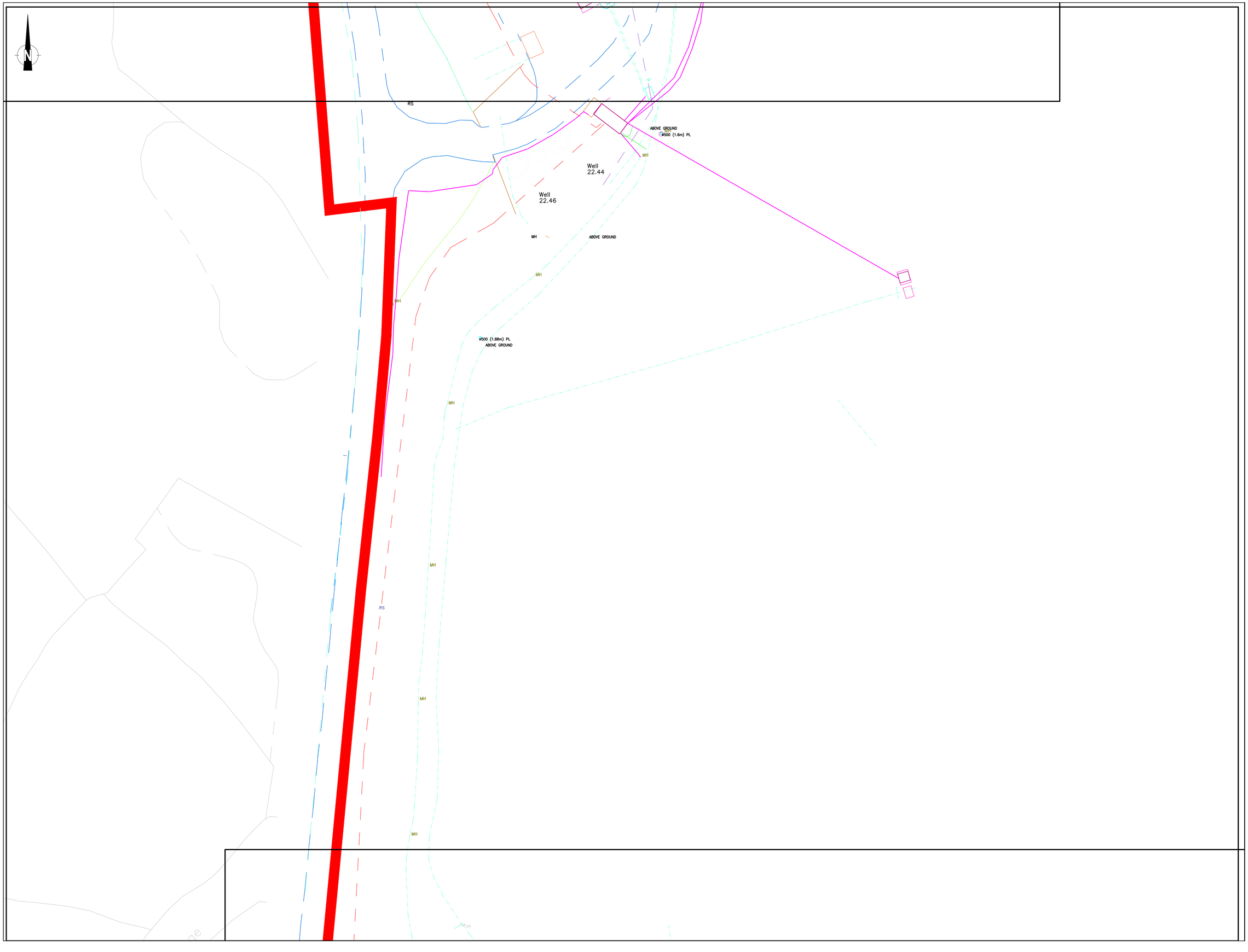

NOTES: GENERAL

1. DO NOT SCALE FROM THIS DRAWING
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KEY:

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- UNDERGROUND ELECTRICITY (415 V)
- UNDERGROUND ELECTRICITY (11 kV)
- UNDERGROUND TELECOMS
- GAS
- SURFACE WATER DRAINAGE
- FOUL DRAINAGE
- WATER MAINS

Rev	Description	Drn	Chk	Date
REVISIONS				

Preliminary Issue		Submitted for S104	
Planning Issue		Issued for Tender	
Submitted for S38		Issued for Construction	
Submitted for S278		As Built	
DRAWING STATUS			

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JOB TITLE
BOVEY BASIN CLAY WORKINGS
KINGSTEIGNTON

DRAWING TITLE
SERVICES
SHEET 5 OF 6

DATE	DRAWN	CHECKED
MAR '25	JH	AL

DRAWING No.	REV.	SCALE	
1205.106E	–	NTS	@ A1

NOTES: GENERAL

1. DO NOT SCALE FROM THIS DRAWING
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- UNDERGROUND ELECTRICITY (415 V)
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- GAS
- SURFACE WATER DRAINAGE
- FOUL DRAINAGE
- WATER MAINS

Rev	Description	Drn	Chk	Date
REVISIONS				

Preliminary Issue		Submitted for S104	
Planning Issue		Issued for Tender	
Submitted for S38		Issued for Construction	
Submitted for S278		As Built	
DRAWING STATUS			

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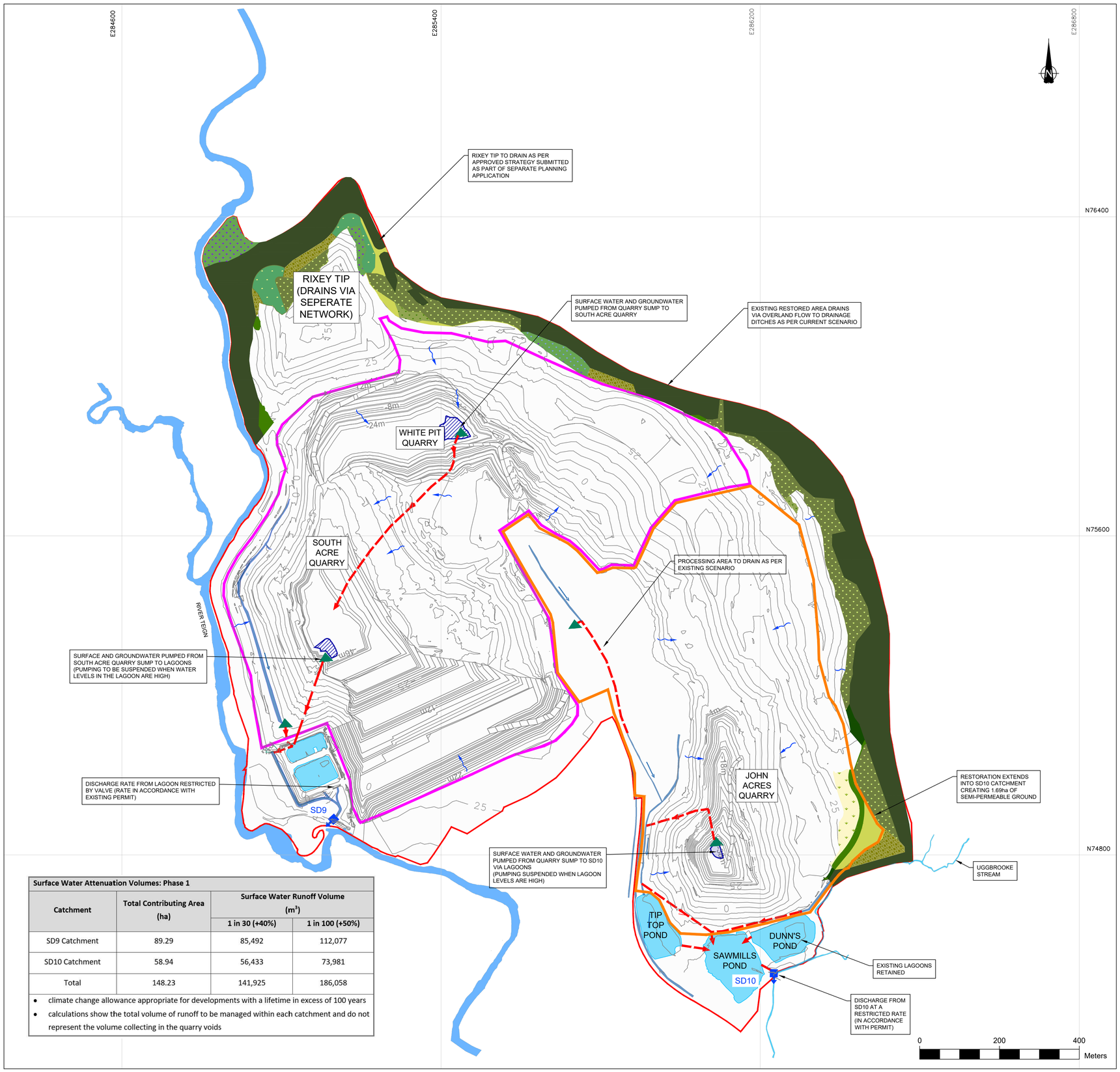
JOB TITLE
BOVEY BASIN CLAY WORKINGS
KINGSTEIGNTON

DRAWING TITLE
SERVICES
SHEET 6 OF 6

DATE	DRAWN	CHECKED
MAR '25	JH	AL

DRAWING No.	REV	SCALE	@
1205.106F	–	NTS	A1

Appendix B
Surface Water Management Plan



Surface Water Attenuation Volumes: Phase 1			
Catchment	**Total Contributing Area (ha)**	**Surface Water Runoff Volume (m^3)**	
		1 in 30 (+40%)	**1 in 100 (+50%)**
SD9 Catchment	89.29	85,492	112,077
SD10 Catchment	58.94	56,433	73,981
Total	148.23	141,925	186,058

- climate change allowance appropriate for developments with a lifetime in excess of 100 years
- calculations show the total volume of runoff to be managed within each catchment and do not represent the volume collecting in the quarry voids

NOTES

1. TO BE READ IN CONJUNCTION WITH FLOOD RISK ASSESSMENT REF: ST18876/APPENDIX 6.1
2. OVERLAND FLOW AND DRAINAGE CHANNEL ROUTES BASED ON TOPOGRAPHICAL SURVEY (REF: SDMP 2021-03-03 OSTN15).
3. OUTFALL CATCHMENT AREAS BASED ON DRAWING REF: DO3/P27/002.

LEGEND

- PLANNING BOUNDARY
- PROPOSED PIPE/PUMPING ROUTE
- EXISTING DRAINAGE DITCH
- SD9 OUTFALL CATCHMENT (C. 51.70ha)
- SD10 OUTFALL CATCHMENT (C. 95.45ha)
- EXISTING OUTFALL POINT
- DIRECTION OF OVERLAND FLOW (INDICATIVE)
- DIRECTION OF WATERCOURSE FLOW (INDICATIVE)
- PROPOSED PUMP
- EXISTING LAGOON/POND
- SUMP AREA (INDICATIVE)

EXISTING RETAINED (DRG ST18876-027)

- NEUTRAL MEADOW (UNIMPROVED)
- NEUTRAL GRASSLAND
- EPHEMERAL / SHORT PERENNIAL
- DENSE SCRUB
- BROADLEAVED WOODLAND

PROPOSED NEW (DRG ST18876-027)

- NEUTRAL MEADOW - PROPOSED
- NEUTRAL GRASSLAND - PROPOSED
- HEATHLAND - PROPOSED
- BROADLEAVED WOODLAND - PROPOSED
- WOODLAND EDGE - PROPOSED
- ATTENUATION POND - PROPOSED
- NATURAL REGENERATION - PROPOSED
- VEGETATION - PROPOSED

FOR MORE INFORMATION REFER TO LANDSCAPE RESTORATION PLAN DRAWING ST18876-027

REVISION	DETAILS	DATE	DRAWN	CHKD	APPD
A	FIRST ISSUE	01/09/23	SJB	BG	DB

CLIENT

SIBELCO UK LIMITED

PROJECT

CENTRAL AREA CONSOLIDATION APPLICATION

DRAWING TITLE

PHASE 1 SURFACE WATER MANAGEMENT PLAN

DRG No.	REV	SUIT. CODE
ST20466-001	A	

DRG SIZE	SCALE	DATE
A1	1:5000	24/08/23

DRAWN BY	CHECKED BY	APPROVED BY
DR/SJB	BG	DB

wardell armstrong

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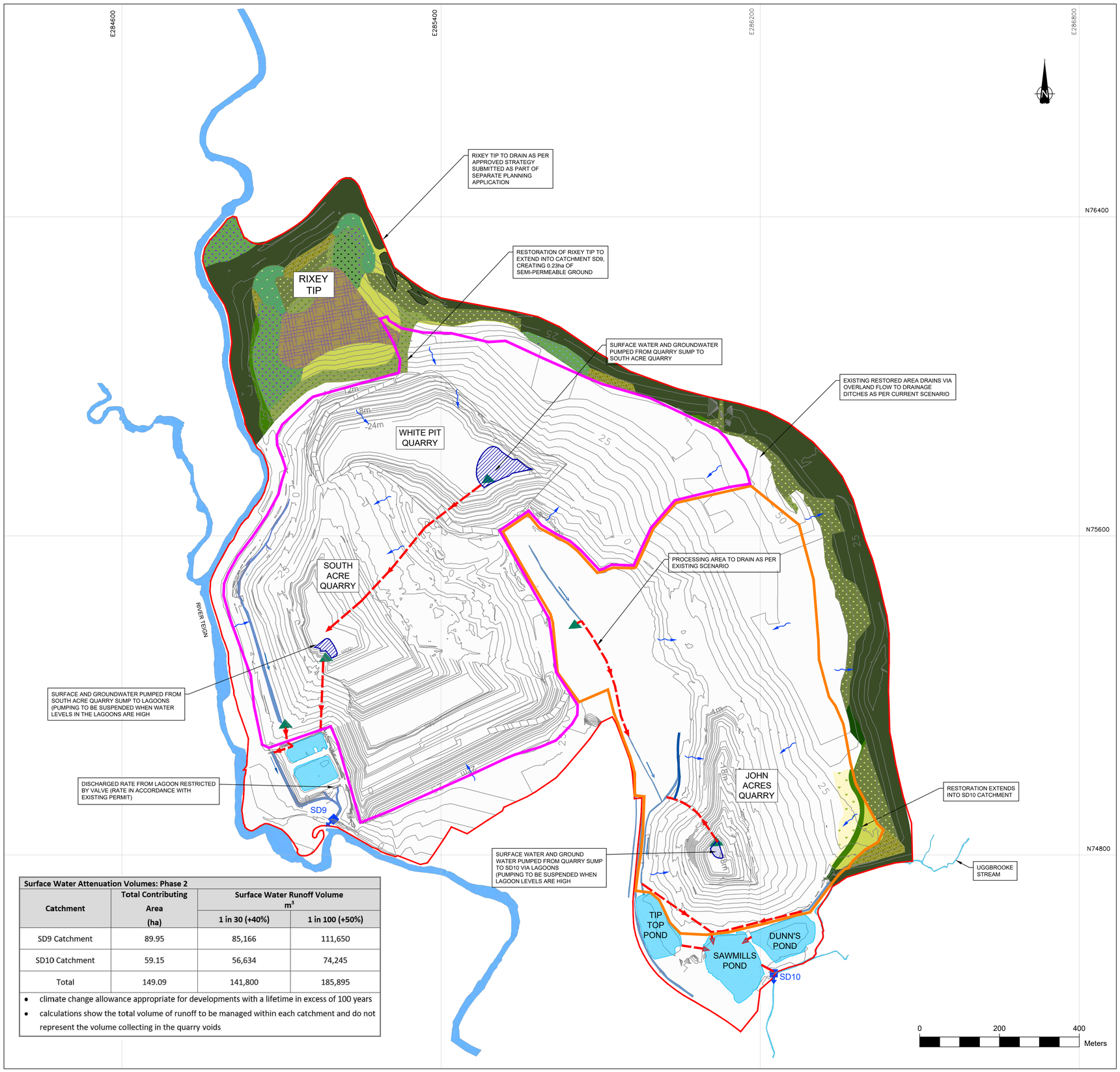

Surface Water Attenuation Volumes: Phase 2

Catchment	Total Contributing Area (ha)	Surface Water Runoff Volume m^3	
		1 in 30 (+40%)	1 in 100 (+50%)
SD9 Catchment	89.95	85,166	111,650
SD10 Catchment	59.15	56,634	74,245
Total	149.09	141,800	185,895

- climate change allowance appropriate for developments with a lifetime in excess of 100 years
- calculations show the total volume of runoff to be managed within each catchment and do not represent the volume collecting in the quarry voids

NOTES

1. TO BE READ IN CONJUNCTION WITH FLOOD RISK ASSESSMENT REF: ST18876/APPENDIX 6.1
2. OVERLAND FLOW AND DRAINAGE CHANNEL ROUTES BASED ON TOPOGRAPHICAL SURVEY (REF: SDMP 2021-03-03 OSTN15).
3. OUTFALL CATCHMENT AREAS BASED ON DRAWING REF: DO3/P27/002.

LEGEND

- PLANNING BOUNDARY
- PROPOSED PIPE/PUMPING ROUTE
- EXISTING DRAINAGE DITCH
- SD9 OUTFALL CATCHMENT (C. 48.78ha)
- SD10 OUTFALL CATCHMENT (C. 79.70ha OPERATIONAL, 17.07ha RESTORED)
- EXISTING OUTFALL POINT
- DIRECTION OF OVERLAND FLOW (INDICATIVE)
- DIRECTION OF WATERCOURSE FLOW (INDICATIVE)
- PROPOSED PUMP
- EXISTING LAGOON/POND
- SUMP AREA (INDICATIVE)

EXISTING RETAINED (DRG ST18876-027)

- NEUTRAL MEADOW (UNIMPROVED)
- NEUTRAL GRASSLAND
- EPHEMERAL / SHORT PERENNIAL
- DENSE SCRUB
- BROADLEAVED WOODLAND

PROPOSED NEW (DRG ST18876-027)

- NEUTRAL MEADOW - PROPOSED
- NEUTRAL GRASSLAND - PROPOSED
- HEATHLAND - PROPOSED
- BROADLEAVED WOODLAND - PROPOSED
- WOODLAND EDGE - PROPOSED
- ATTENUATION POND - PROPOSED
- NATURAL REGENERATION - PROPOSED
- VEGETATION - PROPOSED

FOR MORE INFORMATION REFER TO LANDSCAPE RESTORATION PLAN DRAWING ST18876-027

REVISION	DETAILS	DATE	DRAWN	CHKD	APPD
B	POND REMOVED	21/09/23	DR	BG	DB
A	FIRST ISSUE	01/09/23	SJB	BG	DB

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SIBELCO UK LIMITED

PROJECT

CENTRAL AREA CONSOLIDATION APPLICATION

DRAWING TITLE

PHASE 2
SURFACE WATER MANAGEMENT PLAN

ORG No.	REV	SUIT. CODE
ST20466-002	B	

DRG SIZE	SCALE	DATE
A1	1:5000	29/08/23

DRAWN BY	CHECKED BY	APPROVED BY
DR/SJB	BG	DB

wardell armstrong

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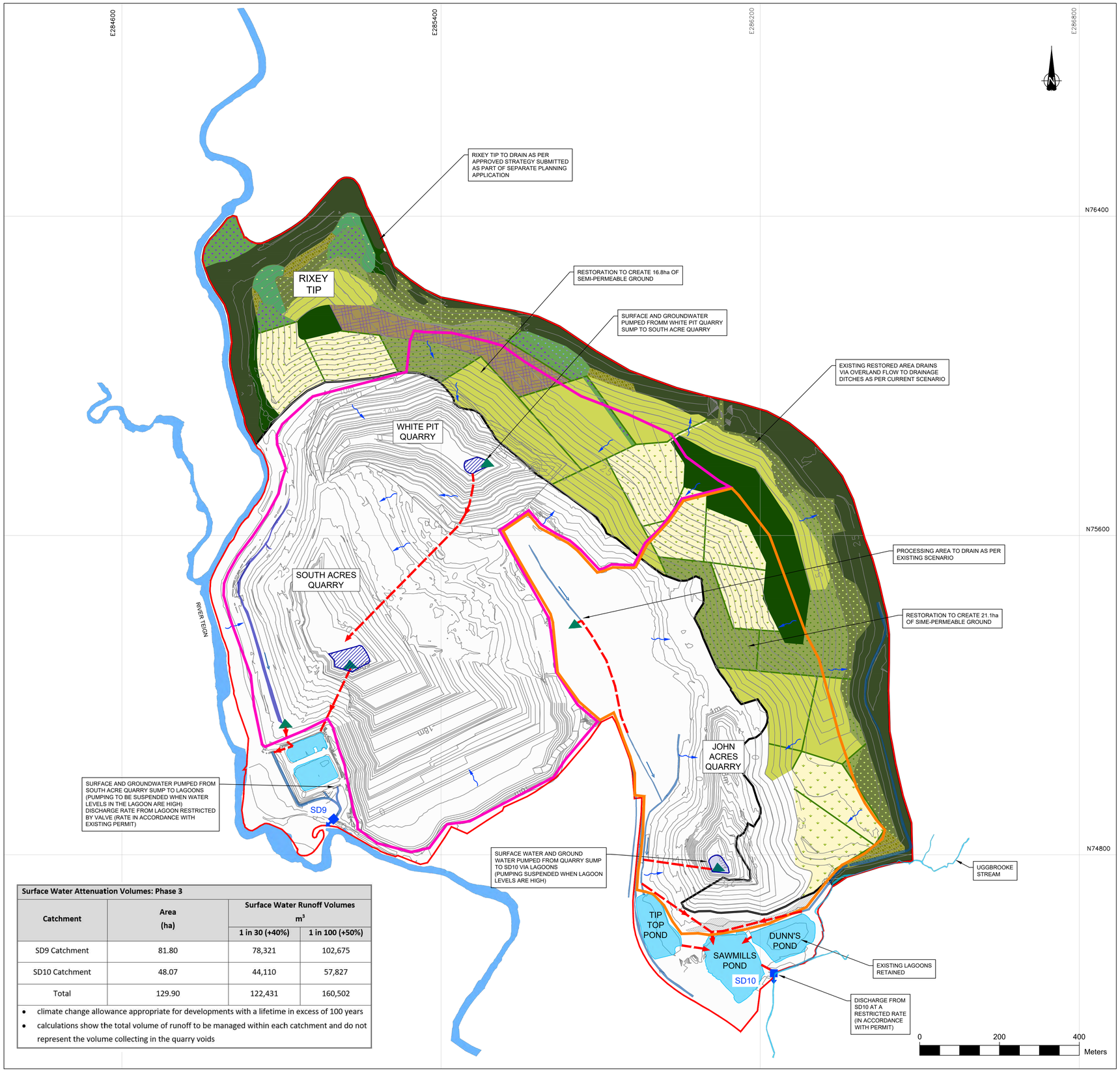

Surface Water Attenuation Volumes: Phase 3

Catchment	Area (ha)	Surface Water Runoff Volumes m^3	
		1 in 30 (+40%)	1 in 100 (+50%)
SD9 Catchment	81.80	78,321	102,675
SD10 Catchment	48.07	44,110	57,827
Total	129.90	122,431	160,502

- climate change allowance appropriate for developments with a lifetime in excess of 100 years
- calculations show the total volume of runoff to be managed within each catchment and do not represent the volume collecting in the quarry voids

NOTES

1. TO BE READ IN CONJUNCTION WITH FLOOD RISK ASSESSMENT REF: ST18876/APPENDIX 6.1
2. OVERLAND FLOW AND DRAINAGE CHANNEL ROUTES BASED ON TOPOGRAPHICAL SURVEY (REF: SDMP 2021-03-03 OSTN15).
3. OUTFALL CATCHMENT AREAS BASED ON DRAWING REF: DO3/P27/002.

LEGEND

- PLANNING BOUNDARY
- PROPOSED PIPE/PUMPING ROUTE
- EXISTING DRAINAGE DITCH
- SD9 OUTFALL CATCHMENT (C. 54.45ha)
- SD10 OUTFALL CATCHMENT (C. 48.76ha OPERATIONAL, 44.48ha RESTORED)
- EXISTING OUTFALL POINT
- DIRECTION OF OVERLAND FLOW (INDICATIVE)
- DIRECTION OF WATERCOURSE FLOW (INDICATIVE)
- PROPOSED PUMP
- EXISTING LAGOON/POND
- SUMP AREA (INDICATIVE)

EXISTING RETAINED (DRG ST18876-027)

- NEUTRAL MEADOW (UNIMPROVED)
- NEUTRAL GRASSLAND
- EPHEMERAL / SHORT PERENNIAL
- DENSE SCRUB
- BROADLEAVED WOODLAND

PROPOSED NEW (DRG ST18876-027)

- NEUTRAL MEADOW - PROPOSED
- NEUTRAL GRASSLAND - PROPOSED
- HEATHLAND - PROPOSED
- BROADLEAVED WOODLAND - PROPOSED
- WOODLAND EDGE - PROPOSED
- ATTENUATION POND - PROPOSED
- NATURAL REGENERATION - PROPOSED
- VEGETATION - PROPOSED

FOR MORE INFORMATION REFER TO LANDSCAPE RESTORATION PLAN DRAWING ST18876-027

REVISION	DETAILS	DATE	DRAWN	CHK'D	APP'D
B	POND REMOVED	21/09/23	DR	BG	DB
A	FIRST ISSUE	01/09/23	SJB	BG	DB

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PROJECT

CENTRAL AREA CONSOLIDATION APPLICATION

DRAWING TITLE

PHASE 3 SURFACE WATER MANAGEMENT PLAN

DRG No.	REV	SUIT. CODE
ST20466-003	B	

DRG SIZE	SCALE	DATE
A1	1:5000	28/08/23

DRAWN BY	CHECKED BY	APPROVED BY
DR/SJB	BG	DB

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DO NOT SCALE FROM THIS DRAWING

NOTES

1. TO BE READ IN CONJUNCTION WITH FLOOD RISK ASSESSMENT REF: ST18876/APPENDIX 6.1
2. OVERLAND FLOW AND DRAINAGE CHANNEL ROUTES BASED ON TOPOGRAPHICAL SURVEY (REF: SDMP 2021-03-03 OSTN15).
3. OUTFALL CATCHMENT AREAS BASED ON DRAWING REF: DO3/P27/002.

KEY

- EXISTING PIPE
- EXISTING DRAINAGE DITCH
- SD9 OUTFALL CATCHMENT
- SD10 OUTFALL CATCHMENT
- EXISTING OUTFALL POINT
- OVERLAND FLOW (INDICATIVE)
- DIRECTION OF WATERCOURSE FLOW (INDICATIVE)
- EXISTING PUMP
- EXISTING SUMP
- EXISTING LAGOON

E284600
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E286800
N76400
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N74800
N74000

DISCHARGES TO RIVER TEIGN
RIXEY TIP
WHITE PIT TIP
AREA DRAINS VIA OVERLAND FLOW TO DRAINAGE DITCHES
SURFACE WATER AND GROUNDWATER PUMPED FROM QUARRY VOID
DISCHARGES TO RIVER TEIGN VIA EXISTING OUTFALL
SURFACE WATER AND GROUND WATER PUMPED FROM QUARRY SUMP TO SOUTH ACRE
WHITE PIT QUARRY
SOUTH ACRE QUARRY
HEATHFIELD TIP
UGBROOKE STREAM
RIVER TEIGN
AREA DRAINS VIA OVERLAND FLOW TO DRAINAGE DITCHES
SURFACE WATER AND GROUND WATER PUMPED FROM QUARRY SUMP TO SD9 VIA SETTLEMENT PONDS
SURFACE WATER PUMP
OPEN DITCH INTERCEPTS SURFACE WATER RUNOFF FROM OUTSIDE VOID
OUTFALL CONTROLLED BY VALVES
SD9
OUTFALL SD9 DISCHARGES TO RIVER TEIGN
JOHN ACRES QUARRY
SURFACE WATER AND GROUNDWATER PUMPED FROM QUARRY SUMP TO SD10 VIA LAGOONS
TIP TOP POND
DUNN'S POND
SAWMILLS POND
SD10
OUTFALL SD10 DISCHARGES TO UGBROOKE STREAM

REVISION	DETAILS	DATE	DRAWN	CHKD	APPD
B	EXISTING DRAINAGE DITCH EXTENDED	21/09/23	DR	BG	AB
A	APPROVED ISSUE	21/09/23	DG	BG	AB

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BOVEY BASIN BALL CLAY WORKS

EXISTING DRAINAGE LAYOUT

DRG No.		REV
ST20466-004		B
DRG SIZE	SCALE	DATE
A1	1:5000	01/09/23
DR	BG	APPROVED BY AB

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BIRMINGHAM, BOLTON, CARDIFF, CARLISLE, EDINBURGH, GLASGOW, LONDON, MANCHESTER, NEWCASTLE UPON TYNE, SHEFFIELD

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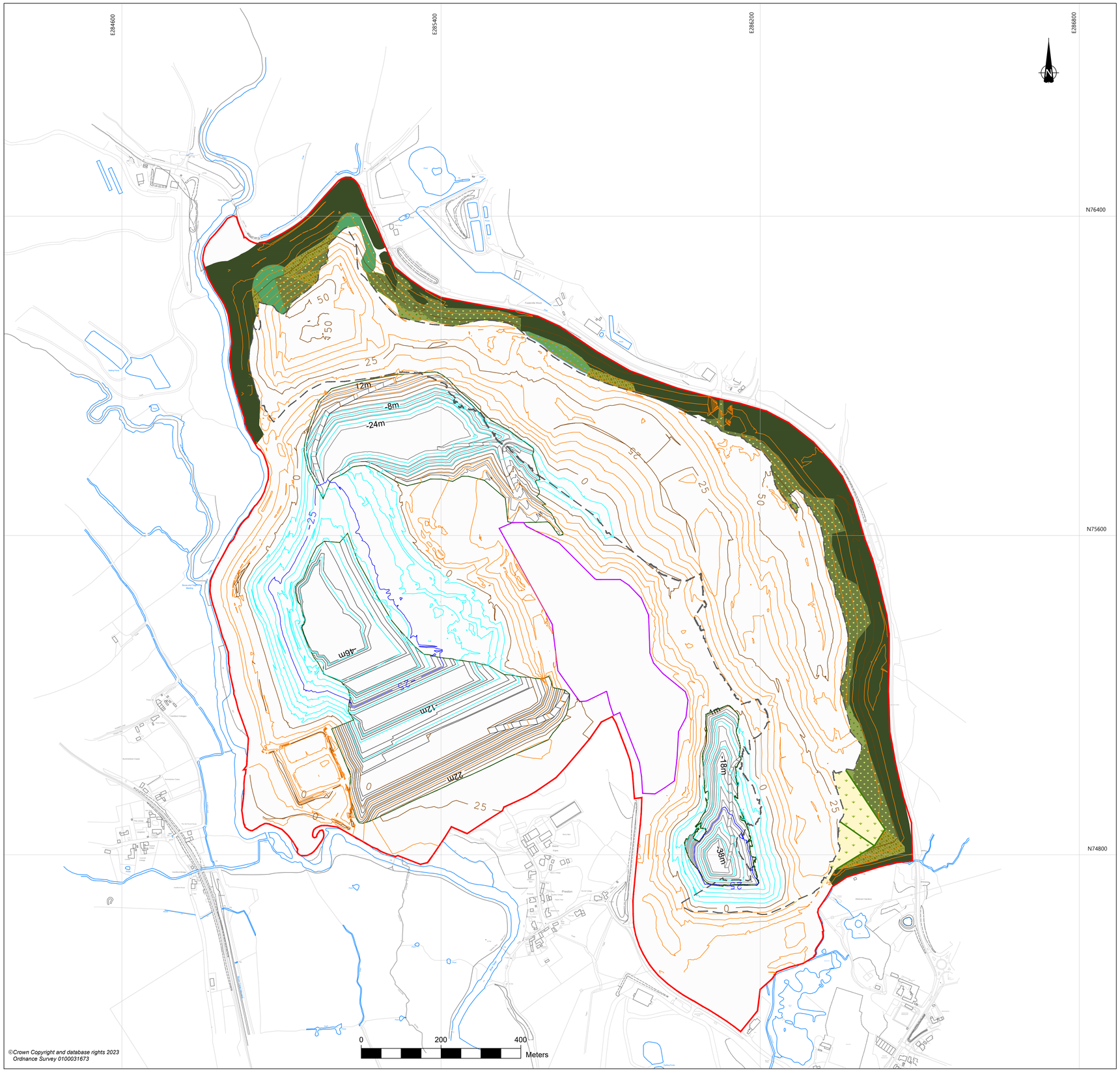
Appendix C
Landscape Master Plan



LEGEND

- PLANNING BOUNDARY
- PRESTON MANOR PROCESSING PLANT
- PHASE 1 EXTRACTION AREA
- ACTIVE PHASE 1 CONTOURS
- CONTOURS WITH POSITIVE VALUES
- CONTOURS WITH NEGATIVE VALUES
- TIPPING FOOTPRINT= 64.354HA (EXTENT OF LANDSCAPE SCHEME= 95.074HA)

EXISTING RETAINED

- NEUTRAL MEADOW (UNIMPROVED)
- NEUTRAL GRASSLAND
- EPHEMERAL / SHORT PERENNIAL
- DENSE SCRUB
- BROADLEAVED WOODLAND

REVISION	DETAILS	DATE	DRAWN	CHKD	APPD
B	AREA OF EXTENT OF LANDSCAPE AMENDED	31/01/23	EL	MP	SR
A	FIRST ISSUE	20/01/23	SJB	MP	SR

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SIBELCO UK LIMITED

PROJECT

CENTRAL AREA
CONSOLIDATION APPLICATION

DRAWING TITLE

PHASE 1
PROGRESSIVE RESTORATION PLAN

ORG No.	REV	SUIT. CODE
ST18876-032	B	

DRG SIZE	SCALE	DATE
A1	1:5000	28/3/2022

DRAWN BY	CHECKED BY	APPROVED BY
EL	AY	SR

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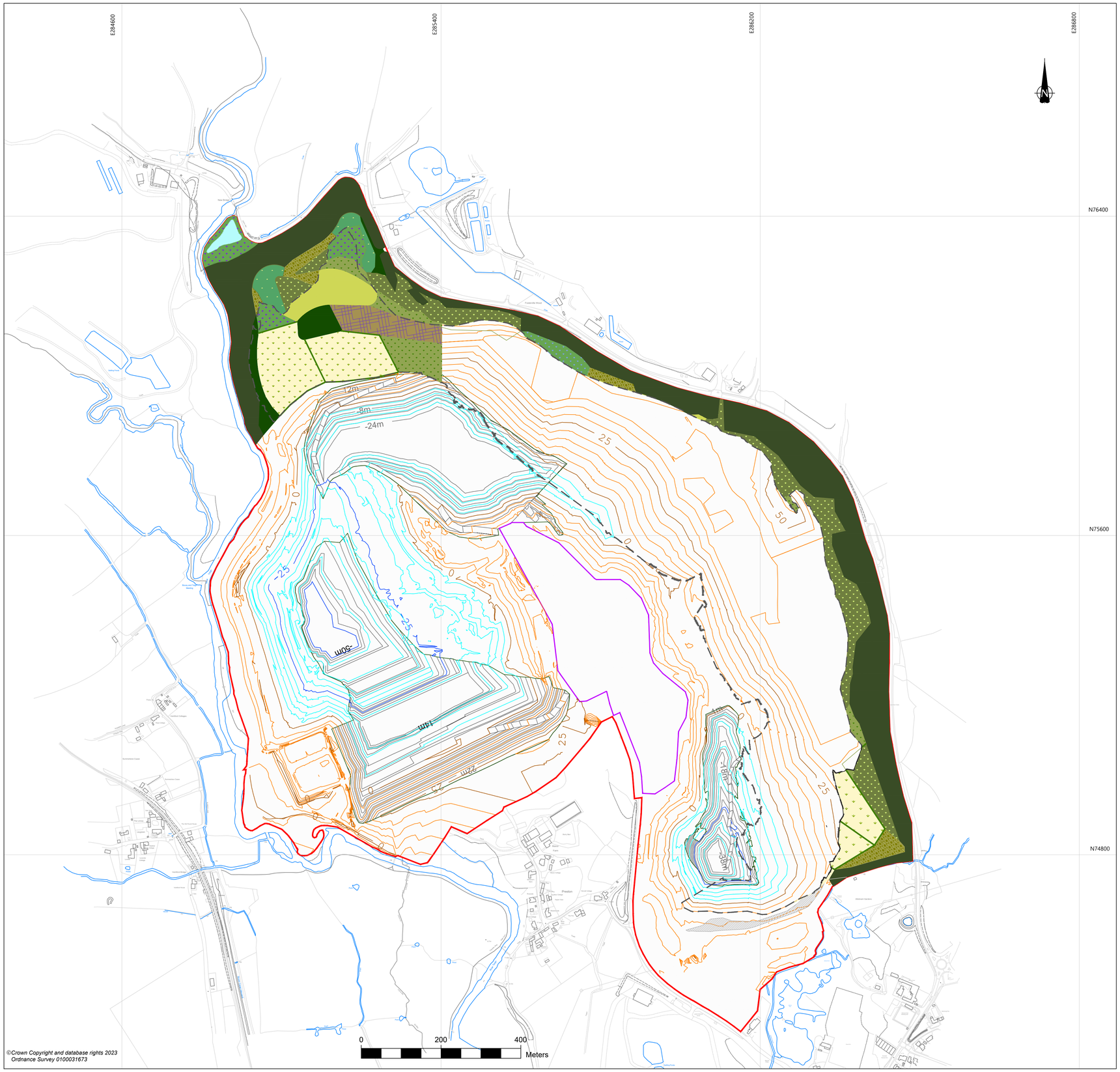

LEGEND

- PLANNING BOUNDARY
- PRESTON MANOR PROCESSING PLANT
- PHASE 1 EXTRACTION AREA
- ACTIVE PHASE 1 CONTOURS
- CONTOURS WITH POSITIVE VALUES
- CONTOURS WITH NEGATIVE VALUES
- TIPPING FOOTPRINT= 64.354HA (EXTENT OF LANDSCAPE SCHEME= 95.074HA)

EXISTING RETAINED

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- DENSE SCRUB
- BROADLEAVED WOODLAND

PROPOSED NEW

- NEUTRAL MEADOW - PROPOSED
- NEUTRAL GRASSLAND - PROPOSED
- HEATHLAND - PROPOSED
- BROADLEAVED WOODLAND - PROPOSED
- WOODLAND EDGE - PROPOSED
- ATTENUATION POND - PROPOSED
- NATURAL REGENERATION - PROPOSED

REVISION	DETAILS	DATE	DRAWN	CHKD	APPD
B	AREA OF EXTENT OF LANDSCAPE AMENDED	31/01/23	EL	MP	SR
A	FIRST ISSUE	25/01/23	SJB	MP	SR

CLIENT

SIBELCO UK LIMITED

PROJECT

CENTRAL AREA
CONSOLIDATION APPLICATION

DRAWING TITLE

PHASE 2
PROGRESSIVE RESTORATION PLAN

ORG No.	REV	SUIT. CODE
ST18876-033	B	

DRG SIZE	SCALE	DATE
A1	1:5000	28/3/2022

DRAWN BY	CHECKED BY	APPROVED BY
EL	AY	SR

wardell armstrong

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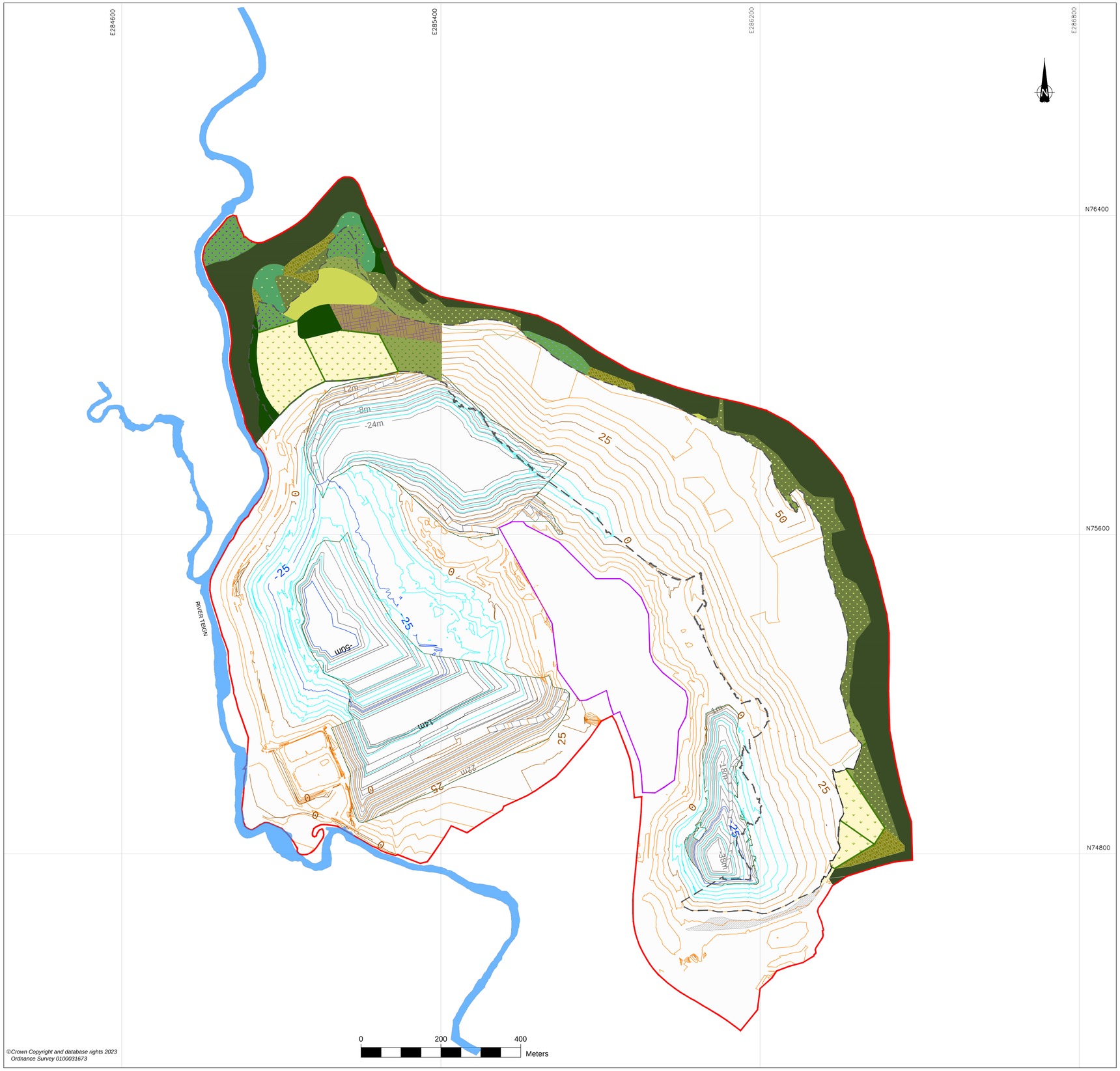
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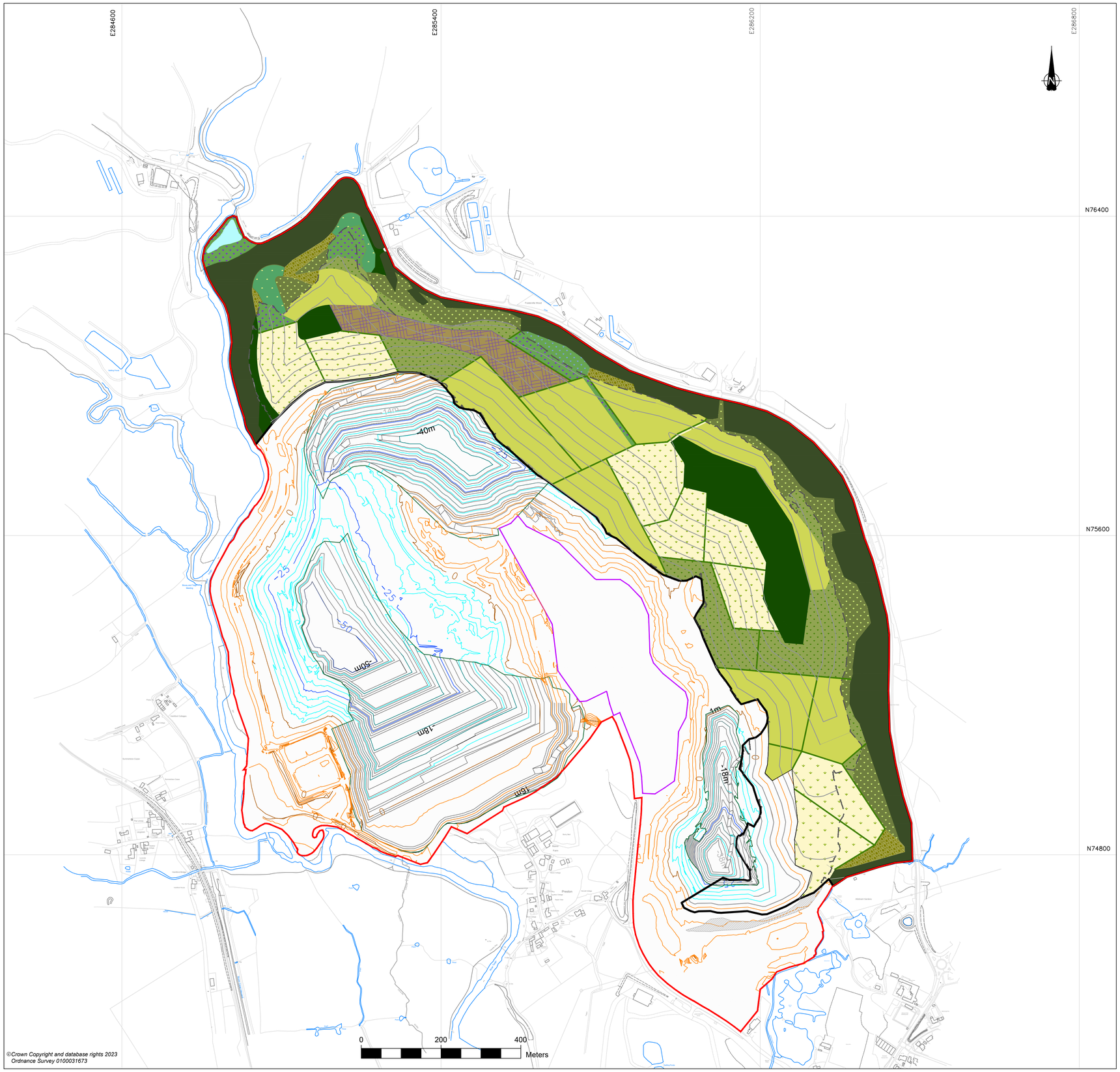

LEGEND

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- BROADLEAVED WOODLAND

PROPOSED NEW

- NEUTRAL MEADOW - PROPOSED
- NEUTRAL GRASSLAND - PROPOSED
- HEATHLAND - PROPOSED
- BROADLEAVED WOODLAND - PROPOSED
- WOODLAND EDGE - PROPOSED
- ATTENUATION POND - PROPOSED
- NATURAL REGENERATION - PROPOSED

REVISION	DETAILS	DATE	DRAWN	CHKD	APPD
C	AREA OF EXTENT OF LANDSCAPE AMENDED	14-03-23	DR	MP	SR
B	AREA OF EXTENT OF LANDSCAPE AMENDED	31/01/23	EL	MP	SR
A	FIRST ISSUE	25/01/23	SJB	MP	SR

CLIENT

SIBELCO UK LIMITED

PROJECT

CENTRAL AREA
CONSOLIDATION APPLICATION

DRAWING TITLE

PHASE 3
PROGRESSIVE RESTORATION PLAN

ORG No. ST18876-034		REV C	SUIT. CODE
DRG SIZE A1	SCALE 1:5000	DATE 28/3/2022	
DRAWN BY EL	CHECKED BY AY	APPROVED BY SR	

wardell armstrong

N:\ST\ST18876 - BOVEY BASIN BALL CLAY WORKINGS\03 - DESIGN\AUTOCAD\ST18876-034-C PHASE 3 PROGRESSIVE RESTORATION PLAN.DWG

LEGEND

- PLANNING BOUNDARY
- PRESTON MANOR PROCESSING PLANT
- PHASE 1 EXTRACTION AREA
- ACTIVE PHASE 1 CONTOURS
- CONTOURS WITH POSITIVE VALUES
- CONTOURS WITH NEGATIVE VALUES
- TIPPING FOOTPRINT= 64.354HA (EXTENT OF LANDSCAPE SCHEME= 95.074HA)

EXISTING RETAINED

- NEUTRAL MEADOW (UNIMPROVED)
- NEUTRAL GRASSLAND
- EPHEMERAL / SHORT PERENNIAL
- DENSE SCRUB
- BROADLEAVED WOODLAND

PROPOSED NEW

- NEUTRAL MEADOW - PROPOSED
- NEUTRAL GRASSLAND - PROPOSED
- HEATHLAND - PROPOSED
- BROADLEAVED WOODLAND - PROPOSED
- WOODLAND EDGE - PROPOSED
- ATTENUATION POND - PROPOSED
- NATURAL REGENERATION - PROPOSED

REVISION	DETAILS	DATE	DRAWN	CHK'D	APP'D
D	POND REMOVED	06/10/23	SJB	CB	CR
C	AREA OF EXTENT OF LANDSCAPE AMENDED	14-03-23	DR	MP	SR
B	AREA OF EXTENT OF LANDSCAPE AMENDED	31/01/23	EL	MP	SR
A	FIRST ISSUE	25/01/23	SJB	MP	SR

CLIENT

SIBELCO UK LIMITED

PROJECT

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ST18876-034	D	

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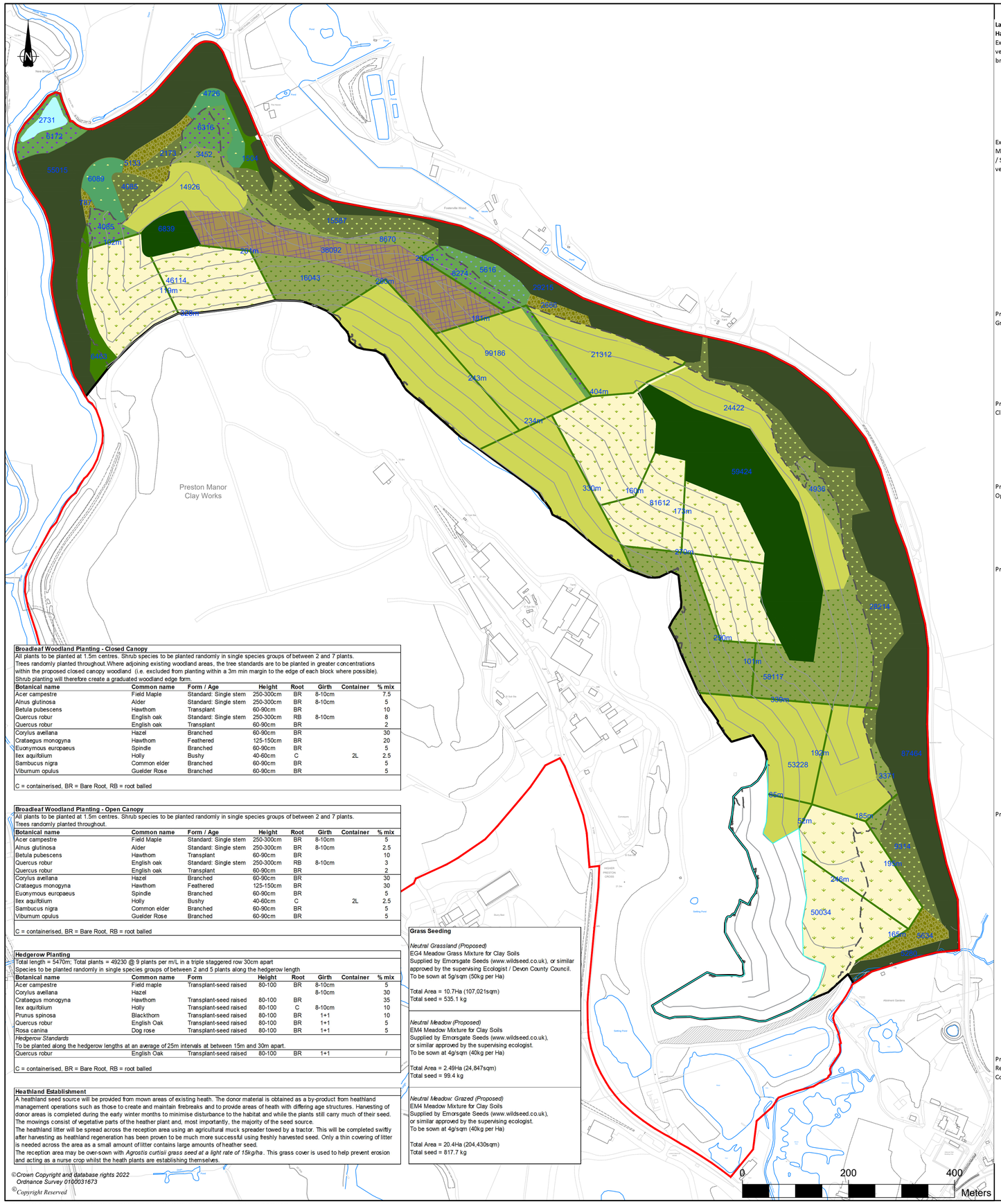
A1	1:5000	28/3/2022

DRAWN BY	CHECKED BY	APPROVED BY
EL	AY	SR

wardell armstrong



Broadleaf Woodland Planting - Closed Canopy

All plants to be planted at 1.5m centres. Shrub species to be planted randomly in single species groups of between 2 and 7 plants.
Trees randomly planted throughout.Where adjoining existing woodland areas, the tree standards are to be planted in greater concentrations within the proposed closed canopy woodland (i.e. excluded from planting within a 3m min margin to the edge of each block where possible).
Shrub planting will therefore create a graduated woodland edge form.

Botanical name	Common name	Form / Age	Height	Root	Girth	Container	% mix
Acer campestre	Field Maple	Standard: Single stem	250-300cm	BR	8-10cm		7.5
Alnus glutinosa	Alder	Standard: Single stem	250-300cm	BR	8-10cm		5
Betula pubescens	Hawthorn	Transplant	60-90cm	BR			10
Quercus robur	English oak	Standard: Single stem	250-300cm	RB	8-10cm		8
Quercus robur	English oak	Transplant	60-90cm	BR			2
Corylus avellana	Hazel	Branched	60-90cm	BR			30
Crataegus monogyna	Hawthorn	Feathered	125-150cm	BR			20
Euonymous europaeus	Spindle	Branched	60-90cm	BR			5
Ilex aquifolium	Holly	Bushy	40-60cm	C		2L	2.5
Sambucus nigra	Common elder	Branched	60-90cm	BR			5
Viburnum opulus	Guelder Rose	Branched	60-90cm	BR			5

C = containerised, BR = Bare Root, RB = root balled

Broadleaf Woodland Planting - Open Canopy

All plants to be planted at 1.5m centres. Shrub species to be planted randomly in single species groups of between 2 and 7 plants.
Trees randomly planted throughout.

Botanical name	Common name	Form / Age	Height	Root	Girth	Container	% mix
Acer campestre	Field Maple	Standard: Single stem	250-300cm	BR	8-10cm		5
Alnus glutinosa	Alder	Standard: Single stem	250-300cm	BR	8-10cm		2.5
Betula pubescens	Hawthorn	Transplant	60-90cm	BR			10
Quercus robur	English oak	Standard: Single stem	250-300cm	RB	8-10cm		3
Quercus robur	English oak	Transplant	60-90cm	BR			2
Corylus avellana	Hazel	Branched	60-90cm	BR			30
Crataegus monogyna	Hawthorn	Feathered	125-150cm	BR			30
Euonymous europaeus	Spindle	Branched	60-90cm	BR			5
Ilex aquifolium	Holly	Bushy	40-60cm	C		2L	2.5
Sambucus nigra	Common elder	Branched	60-90cm	BR			5
Viburnum opulus	Guelder Rose	Branched	60-90cm	BR			5

C = containerised, BR = Bare Root, RB = root balled

Hedgerow Planting

Total length = 5470m; Total plants = 49230 @ 9 plants per m/L in a triple staggered row 30cm apart
Species to be planted randomly in single species groups of between 2 and 5 plants along the hedgerow length

Botanical name	Common name	Form	Height	Root	Girth	Container	% mix
Acer campestre	Field maple	Transplant-seed raised	80-100	BR	8-10cm		5
Corylus avellana	Hazel				8-10cm		30
Crataegus monogyna	Hawthorn	Transplant-seed raised	80-100	BR			35
Ilex aquifolium	Holly	Transplant-seed raised	80-100	C	8-10cm		10
Prunus spinosa	Blackthorn	Transplant-seed raised	80-100	BR	1+1		10
Quercus robur	English Oak	Transplant-seed raised	80-100	BR	1+1		5
Rosa canina	Dog rose	Transplant-seed raised	80-100	BR	1+1		5
Hedgerow Standards							
To be planted along the hedgerow lengths at an average of 25m intervals at between 15m and 30m apart.							
Quercus robur	English Oak	Transplant-seed raised	80-100	BR	1+1		/

C = containerised, BR = Bare Root, RB = root balled

Heathland Establishment

A heathland seed source will be provided from mown areas of existing heath. The donor material is obtained as a by-product from heathland management operations such as those to create and maintain firebreaks and to provide areas of heath with differing age structures. Harvesting of donor areas is completed during the early winter months to minimise disturbance to the habitat and while the plants still carry much of their seed. The mowings consist of vegetative parts of the heather plant and, most importantly, the majority of the seed source.
The heathland litter will be spread across the reception area using an agricultural muck spreader towed by a tractor. This will be completed swiftly after harvesting as heathland regeneration has been proven to be much more successful using freshly harvested seed. Only a thin covering of litter is needed across the area as a small amount of litter contains large amounts of heather seed.
The reception area may be over-sown with *Agrostis curtisii grass seed at a light rate of 15kg/ha*. This grass cover is used to help prevent erosion and acting as a nurse crop whilst the heath plants are establishing themselves.

Grass Seeding

Neutral Grassland (Proposed)
EG4 Meadow Grass Mixture for Clay Soils
Supplied by Emorsgate Seeds (www.wildseed.co.uk), or similar approved by the supervising Ecologist / Devon County Council.
To be sown at 5g/sqm (50kg per Ha)

Total Area = 10.7Ha (107,021sqm)
Total seed = 535.1 kg

Neutral Meadow (Proposed)
EM4 Meadow Mixture for Clay Soils
Supplied by Emorsgate Seeds (www.wildseed.co.uk),
or similar approved by the supervising ecologist.
To be sown at 4g/sqm (40kg per Ha)

Total Area = 2.49Ha (24,847sqm)
Total seed = 99.4 kg

Neutral Meadow: Grazed (Proposed)
EM4 Meadow Mixture for Clay Soils
Supplied by Emorsgate Seeds (www.wildseed.co.uk),
or similar approved by the supervising ecologist.
To be sown at 4g/sqm (40kg per Ha)

Total Area = 20.4Ha (204,430sqm)
Total seed = 817.7 kg

Landscape Feature / Habitat Type	Description	Key Landscape and Ecological Benefits	Proposed Management
Existing Areas of Woody vegetation and broadleaf woodland	Woodland and scrub native species within the site: establishing areas of planted mixed deciduous native tree and shrub species, and mature established mainly native deciduous with holly woodland with upper canopy and scrub understorey layer below, with native flora ground layer in less shaded some areas.	Important landscape features adding sense of enclosure and landscape value. Possible screening value. Important general wildlife habitat, particularly important for dormice and bat flight routes on edges.	Manage to maintain as mixed woodland containing mature trees with understorey and a ground flora layer. Particularly seek to retain the older, mature trees which are generally of greatest landscape and ecological value, but seek to retain those younger trees which will eventually reach full maturity. Manage the woody nature of young / establishing tree cover to develop into mature woodland. The mosaic of scrub and trees on woodland edges is to be kept. Maintain the woodland edges to continue and encourage as bat flight routes through taller trees whilst having a lower shrub layer particularly beneficial to birds and small mammals.
Existing Grassland, Meadow and Ephemeral / Short perennial vegetation	Grassland is typically dominated by Yorkshire fog with frequent sweet vernalgrass, red clover, broadleaved dock, compact rush, creeping buttercup, ragwort, bird's-foot trefoil, creeping thistle. Unimproved neutral meadow is herb-rich and contains primarily species characteristic of mesotrophic soils. Grasses formed approximately 20% of the sward and were dominated by false-oat grass and cock's foot. Ephemeral habitat has colonised areas which have not been recently disturbed. Vegetation cover is relatively sparse due to the absence of topsoil.	Important ecologically, to enhance the foraging opportunities over the fields proposed for compensation so that bat population security is guaranteed. An ecologically important function for invertebrates and bats. The unimproved meadow habitat was currently analogous with the Priority Habitat: 'Lowland Meadow' and the Devon BAP Habitat: 'Flower-rich Meadows and Pastures'. The habitat was deemed to meet the County Wildlife Site criteria.	Management of the extent of bramble, European gorse and grey willow beginning to encroach into the existing and newly created Meadow areas. Where appropriate, both grassland and meadow can be managed through a hay cutting regimen. Hay meadows should be allowed to grow between March and end of August. Cut should be undertaken when the hay is ready between late July at the earliest and late August. The arisings should be collected and removed. Once cut the meadows should be grazed in combination with the pasture management regime with stock being removed by mid-March at the latest.
Proposed Neutral Grassland and Meadow	Proposed areas on the tip slopes, adjacent to and linking with existing areas of neutral grassland either with topsoil absent or with a range of depths from circa 25mm depth to circa 100mm to 150mm depth on proposed pastures	Important ecologically, to enhance the foraging opportunities over the fields proposed for compensation so that bat population security is guaranteed. New meadow areas enhance existing pockets of meadow, increasing opportunities for species diversity and supporting the John Acres Strip pCWS within the site.	Seek to deliver on-going grazing/hay cropping to maintain and enhance value of existing areas of pasture and lowland grassland in the vicinity. An increased number of pastures managed for grazing would provide increased bat food source. Hay meadows should be allowed to grow between March and end of August. A hay cut should be undertaken when the hay is ready between late July at the earliest and late August. Arisings should be collected and removed. Once cut the meadows should be grazed in combination with the pasture management regime with stock being removed by mid-March at the latest.
Proposed Woodland - Closed	Proposed more dense blocks of native species woodland trees and shrubs located adjoining existing woodland areas.	Landscape function includes screening, visually 'softening' road corridor, adding to the typical local landscape character. Primary ecological function is to reinforce the bat flight corridors where planted within the road corridor and to provide habitat for dormice and other species.	Aim to achieve maturity to woodland with upper tree canopy and with shrub layer below, the edges being shrubbier if possible. Thin as they mature. Seek to achieve and maintain woodland edge function of a flight route for bats and as a habitat for small mammals and birds.
Proposed Woodland - Open	Proposed more open blocks of native species woodland trees and shrubs located on the restored tip slopes and tops within the site.	Landscape function includes wooded blocks within field mosaic of restored tip slopes adding to the typical local landscape character. Primary ecological function is to reinforce the bat flight corridors where planted within the grassland/pasture areas and to provide habitat for dormice and other species.	Aim to achieve maturity to woodland with upper tree canopy and with shrub layer below, the edges being shrubbier if possible. Thin as they mature, with the least dense woodland being at the higher elevations. Seek to achieve and maintain woodland edge function of a flight route for bats and as a habitat for small mammals and birds.
Proposed Hedgerows	Proposed mixed native species hedgerows within the site primarily dividing and enclosing areas of grazed neutral grasland (pasture) comprising shrubs interspersed with hedgerow standards	Important new landscape features adding sense of enclosure and landscape value. Possible screening value. Important general wilddlife corridor habitat,particularly important for dormice and as bat flight routes Also, particularly on the restored tip slopes, to rovide and improve shelter from strong winds and increase the value of the pastures to foraging bats when perching (at about 2m from ground level from projecting branches) and hawking (within 5m of linear features)	New hedgerow will create additional hedgerow habitat to enhance the network of commuting and dispersal routes for bats, dormice and other species. The measures described below pertain largely to greater horseshoe bats as maintaining and enhancing commuting routes is key to the conservation of the colony roosting at Chudleigh Caves However, these measures will also benefit other bat species, birds and reptiles. The aim is to improve the quality and extent of flight paths through the landscape and to provide increased hawking and perch-hunting opportunities for bats. To create hedgerows of nature conservation interest, native trees and shrubs that are common in the local area will be planted. Broad hedgerows will be createdby planting shrubs in staggered rows with tree species including oak and field maple. New plants will be adequately protected from stock and rabbit grazing damage through the use of suitable fencing enclosure. Hedges to be managed to create tall, bushy, broad hedges ideally 3-6m in width with an average height of 3m to provide sheltered flight paths and enhanced foraging opportunities for bats when perching and hawking and enhanced nesting habitat for birds. Hedgerow trees to be left to mature. Long term management includes cutting back to both sides to ensure hedgerow doesn't become top heavy and subject to collapse due top basal thinning thus reducing screening ability. Maintain to height suitable for bats to echolocate. Ensure trees planted in hedgerows are not cut back and encourage trees to grow through the hedgerow in suitable locations.
Proposed Pasture	Areas of new neutral grassland enclosed by woodland and hedgerows across the tip slopes to be managed via grazing.	Pastures add to the local landscape mosaic and fulfilling an important ecological function particularly where actively grazed and related invertebrate ecology important as a bat food source. Pastures will each be sub-divided into smaller grazing units with dividing hedgerows. The foraging value of the pastures will be significantly increased by this sub-division into a mosaic of smaller units that are sheltered from wind impacts. These will provide immediate benefits after creation, whilst trees & shrubs planted adjacently, and within the hedge rows, are establishing themselves. Gaps in the hedgerows provided with gates are to be provided to allow stock to either roam among all fields, or be restricted as dictated by the grazing situation. As such although the fields will be small, grazing animals can move between fields as they wish effectively creating larger grazing units if required.	Pasture habitat will be created within those fields described above by a grazing regime of livestock (cattle/sheep) to provide dung that will support dung beetles for the majority of the year. Small numbers of hardy cattle, from July to October, reducing in number from November to April). If sheep-worrying is not a problem, or can be controlled, sheep can be used from October to April. Jacob sheep may be the best choice (stocked at lower numbers over winter, and increasing in summer). A mixture of cattle, sheep and/or horses over winter is preferable. Rotation of animals and fields should assist with parasite control. No ivermectins should be used to treat livestock, and advice should be sought from NE as to the acceptable treatments for any horses. (Ref; Managing landscapes for the greater horseshoe bat. Anon. English Nature 1998.) To support grazing water troughs and shelters for stock will need to be provided at a sufficient density. Stock shelters will provide hanging up night roosts for bats foraging over the fields particularly juvenile bats. Stock shelters should comprise a single, partly open-fronted stock shelter minimum 5m long by 3m wide footprint that is 3m high at the apex will be built. Detailed features to benefit horseshoe bats will be incorporated. The shelter will provide cover in winter for cattle or other grazers and night-roosts for use by both adults and juveniles. They will be especially valuable to juveniles when they first forage, as they will provide security against predator attacks whilst resting between foraging bouts whilst foraging on Aphodius beetles.
Proposed Natural Regeneration / Colonisation	These to be left to recolonize on their own accord (as has already occurred on previously topsoiled tip slopes where restoration has already been undertaken). If natural colonisation of grassland does not occur, or only weak establishment occurs in areas to be used as pasture, overseeding with a suitable agricultural seed mix will be undertaken.	Important landscape element forming part of the mosaic of the tip slopes restoration character.	Manage to seek successful establishment of grassland natural colonisation of tip slopes and pastures, and then monitor how the pattern and types of habitat which occurs as a result of natural colonisation. In particular check on the extent of scrub establishment and how this affects the overall landscape and ecological objectives. It may be necessary to cut back or remove some areas if this is located in an unsuitable location whilst other areas could be left to establish through seer stages, potentially to woodland. During establishment of grasslands, manage to remove invasive/problematic species.

KEY

- SITE BOUNDARY
- Tipping footprint= 64.354Ha (Extent of landscape scheme= 95.074Ha)
- 45.6 New or existing habitat area to be retained or created (sqm) or hedge length (linear metres)
- Neutral Meadow (unimproved) 5616sqm
- Neutral Grassland 59373sqm
- Ephemeral / Short perennial 10815sqm
- Dense scrub 14240sqm
- Broadleaved Woodland 176974sqm
- Natural Regeneration - Proposed 213074sqm
- Neutral Meadow - Proposed 24847sqm
- Neutral Grassland - Proposed 94589sqm
- Neutral Grass (grazed) - Proposed 177760sqm
- Heathland - Proposed 38092sqm
- Woodland (Open) - Proposed 66263sqm
- Woodland (Closed) - Proposed 7967sqm
- Attenuation Pond - Proposed 2731sqm
- Hedgerows - Proposed 4985mL

REVISION	DETAILS	DATE	DRAWN	CHK'D	APP'D
A	FIRST ISSUE	10/01/23	SJB	MP	SR

CLIENT
SIBELCO Ltd.

PROJECT
BOVEY BASIN
BALL CLAY WORKINGS CENTRAL AREA
KINGSTEIGNTON, DEVON

DRAWING TITLE
SITE RESTORATION
DETAILED LANDSCAPING PLAN

DRG No.	REV	SUIT. CODE
ST18876-035	A	
DRG SIZE: A1	SCALE: 1:400	DATE: 06/01/2023
DRAWN BY: KMS	CHECKED BY: MP	APPROVED BY: SR

wardell armstrong

N:\ST\ST18876 - BOVEY BASIN BALL CLAY WORKINGS\03 - DESIGN\AUTOCAD\ST18876-035-A LANDSCAPE DETAILED RESTO MASTERPLAN PLANTING AMENDMENT REV 1.DWG

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