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Operating Techniques

v1.0

Environmental and sustainability solutions provided to

Brockley Wood Ventures Ltd

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1.0 INTRODUCTION

1.1 Overview

This report describes the operating techniques that will be implemented at the 'deposit for the purposes of recovery' facility to ensure compliance with the conditions of the environmental permit. The report has been written to satisfy the requirements of Environment Agency (EA) [Waste recovery plans and deposit for recovery permits - GOV.UK](https://www.gov.uk/guidance/waste-recovery-plans-and-deposit-for-recovery-permits) and is divided into the following sections.

1. Introduction
2. Management
3. Operations
4. Process description and material import
5. Information
6. Final site restoration

1.2 Site setting

The entire site, centred at Grid Reference TM 117 403, is mainly arable farmland of some 35.8 ha (88.5ac) set in Suffolk. It is located primarily within Belstead Parish approximately 6.5km to the south-west of the town centre of Ipswich, approximately 1km south-west of Belstead village, 1km south-east of Copdock village and 3km north of Bentley village.

1.3 Site description

The site is accessed via an agricultural entrance located on the slip road roundabout for Junction 32B of the A12 and by an access track which follows the highway boundary northwards towards Brockley Wood. Beyond the access track the site comprises of six arable fields of varying sizes bounded by the A12 on its north-western boundary and by woodland and field boundaries and hedgerows on its remaining boundaries to the north, east and south. The site lies within a landscape which is part of an extensive, low-lying plateau area etched by streams and rivers and predominantly in use as agricultural land, with small copses and areas of woodland including Old Hall Wood to the south-east of the site, Brockley Wood to the south and Bentley Long Wood which lies to the south of the site access.

The site ranges in elevation from about 42m AOD to about 45m AOD and there is a small swale and stream and copse in the northern part of the site. The stream flows beneath the A12 in a culvert, where the levels are about 36m AOD, and then eastwards towards the Alton water reservoir.

1.4 Guidance

In 2000 the Ministry of Agriculture, Fisheries and Food (MAFF) published its Good Practice Guide for Handling Soils by a range of earth-moving machines. This was a comprehensive guide to soil handling practices to help achieve a high standard of reclamation for mineral extraction sites across all agricultural land qualities (DoE 1989; DETR 1999; Welsh Assembly Government 2004 & 2009; Welsh Government 2021). It also contributed to the drive to achieve a more sustainable use of soils (DEFRA 2009a & 2009b).

The focus of current UK Government policy in England, as set out in its 25 Year Environmental Plan (DEFRA, 2018), is to safeguard soil resources (as Natural Capital, DEFRA, 2021) and that by 2030 for all soils to be managed sustainably.

Good quality agricultural soils are to be protected, and all soils are to be fully valued for their environmental and ecosystem services and are to be better managed to improve soil health. The purpose of this updated guidance is to assist the mineral industry in their contribution by achieving sustainable soil based after uses and that impacts on the soil resources and soil functions are minimised and enhanced wherever possible.

To address the new Natural Capital driven policies for protection of soil resources and their sustainable management, soil compaction and its associated limitations on soil functions, the prime aim of the operation is to minimise the compaction of soils as they are handled with minimal reliance on the need for remedial treatment of compaction caused by the machinery and handling practices. Soil is a vulnerable and essentially non-renewable resource. One hectare of topsoil, the most productive soil layer, can contain up to 5 tonnes of living organisms and because it can take more than 500 years to form a 2cm thickness, it is in practical terms non-renewable.

The soil stripping, storage and backfilling operations are all informed by the Soil Resource and Management Plan that characterises the soil resources available to successfully deliver the intended after use. It underpins the operational design, land use and landscaping plan, the practices needed to be deployed, and the means of communication to all those involved. The importance of competency in the technical understanding of soils and the implications of the operational practices is also emphasised.

2.0 MANAGEMENT

2.1 Management system

Brockley Wood Ventures Limited will operate their own 'in-house' management system which will ensure that:

- The risks that the activities pose to the environment are identified.
- The measures that are required to minimise the risks are identified.
- The activities are managed in accordance with the management system.
- Performance against the management system is audited at regular intervals; and
- The environmental permit is complied with.

The management system will be supplemented by this document which outlines the proposed operating techniques at the site and demonstrates conformance with the requirements of [Non-hazardous and inert waste: appropriate measures for permitted facilities - Guidance - GOV.UK](#)

2.2 Management structure and responsibilities

The Site Manager (SM) will be responsible for normal day to day operations and ensuring compliance with all environmental permits that cover the activities carried out on site.

Whenever the site is open to receive or dispatch wastes, or is operating any of the waste management activities, supervision will be provided by at least one member of staff who is suitably trained and fully conversant with the requirements of the permit regarding:

- Waste acceptance and control procedures.
- Operational controls.
- Maintenance.
- Record-keeping.
- Emergency action plans; and
- Notifications to the EA

2.3 Technical competence and training

The site will be managed by sufficient staff who are competent to operate the site. The management system will ensure that:

- all staff will have clearly defined roles and responsibilities.
- records will be maintained of the skills required for each post.
- records will be maintained of the training and relevant qualifications undertaken by staff to meet the requirement of each post; and
- operations will be governed by standard operating procedures (SOPs).

Operations at the site will be under the overall control of a Technically Competent Manager (TCM) who holds the relevant Certificate of Technical Competence (CoTC) under the Waste Management Industry Training and Advisory Board (WAMITAB) scheme.

An assessment of staff training needs will be carried out to identify the positions for which specific environmental awareness training is needed, and to determine the scope and level of such training. The assessment of training needs will be reviewed on an annual basis.

The training programme will ensure that relevant staff are aware of the following:

- Regulatory implications of the EP for the site and their specific work activity.
- All potential environmental effects from operations under normal and abnormal circumstances.
- The need to report deviations from the permit; and
- Prevention of accidental emissions and action to be taken should accidental emissions occur.

2.4 Site Permit

A copy of the permit and the management system will be kept available for reference by all staff and contractors whose work could impact upon the environment.

2.5 Site security

So that unauthorised access is prevented, several site security measures will be in place including;

- Fencing along the site boundary; and
- A gate located at the entrance to the site, which will be locked when the site is closed.

The site will be inspected at the beginning of each working day. Any defects or damage which compromises the integrity of the security measures will be made right by temporary repair by the end of the working day. Permanent repairs will be fitted within 5 working days.

All inspections, any defects, damage or repairs will be recorded in the site diary.

2.6 Managing documentation and records

Controls will be in place to ensure that all documents are issued, revised and maintained in a standardised arrangement.

The documents that will be included within the scope of the controls are as follows:

- Policies.
- Responsibilities.
- Targets.
- Maintenance records.
- Procedures.
- Monitoring records.
- Results of audits.
- Results of reviews.
- Complaints and incident records; and
- Training records.

Operational records will be produced and kept up to date daily to reflect waste movements, both internally and off-site. All records relating to the waste acceptance will be maintained and kept on-site for a minimum of two years.

2.7 Reporting non-compliance and taking corrective action

Procedures in place will ensure appropriate corrective action is taken in response to problems identified at the site. The procedure will ensure that non-conformances are reported, investigated and rectified, and that failures and limitations are prevented. The following aspects will be considered:

- Actual or potential non-compliance.
- System failure discovered at internal audit.

- Suppliers or subcontractors breaking agreed operating rules.
- Incidents, accidents, and emergencies.
- Malfunction, breakdown or failure of plant.
- Other operational system failure; and
- Complaints.

The action taken in response to the non-conformance will include, but not limited to:

- Obtaining additional information on the nature and extent of the non-conformance.
- Reviewing and testing alternative solutions.
- Adjusting procedures and responsibilities.
- Requesting approval for additional resources and training; and
- Contacting suppliers and contractors (as applicable).

2.8 Compliance checking

There will be a formalised internal assessing procedure to ensure the site is reviewed at regular intervals and that the progress of corrective and preventative action is checked.

2.9 Operational control, preventative maintenance and calibration

The management system will work alongside operational procedures to ensure effective control of site operations, the use of approved suppliers and contract services, the maintenance of operational equipment and the calibration of any monitoring equipment.

All plant and equipment will be subject to a programme of planned preventative maintenance which will follow the inspection and maintenance schedule recommended by the manufacturer.

2.10 Design and constructions

All appropriate elements of the site which are not currently constructed will be designed in accordance with recognised standards, methodologies and practices. The design process will use a risk-based approach and will be appropriately documented using drawings, specifications and method statements to provide an adequate audit trail.

Construction Quality Assurance (CQA) plans will oversee all construction activities necessary in the future. All CQA plans will be prepared by competent and suitably qualified persons. A competent and suitably qualified person will supervise the construction activities.

2.11 Accident Management Plan

Brockley Wood Ventures Limited recognises the significance of the avoidance of accidents that could have environmental impacts and that it is essential to restrict those consequences as far as possible.

An Accident Management Plan [AMP] will be put into operation and maintained at the site to make sure that site staff are fully prepared for any such incidents. The AMP will be reviewed at least every four years or as soon as practicable after an incident, with any changes made to further reduce the risk of incidence.

The following AMP describes the techniques that will be implemented to minimise the risks posed to the environment. Activities affecting the health and safety (H&S) of operatives, contractors and visitors will be separately managed in compliance with H&S regulations and company H&S Policy.

2.12 Hazard identification

The following hazards were identified in the Environmental Risk Assessment included in the permit application:

- Unauthorised waste.
- Equipment fire.
- Spillage and leakage.
- Security and vandalism; and
- Flooding.

The following sections summarise the processes which will be used to reduce the possible causes and impacts of accidents at the site.

2.13 Unauthorised waste receipt and processing

Accepting unpermitted waste materials to the restoration operation could have detrimental consequences upon the environment. These impacts include risks connected with odour and the potential contamination of land and water.

To control this risk, only those waste that pass the acceptance criteria will be accepted for recovery. All wastes will be subject to inspection and checking against the declaration on the waste transfer note. Documentation will accompany all waste material accepted. Should unauthorised waste be discovered at the site, the waste will be segregated and stored in a designated quarantine/isolation area prior to transfer from site.

2.14 Equipment fire

In the unlikely event of a fire, the following actions will be taken:

- The site manager will be informed immediately.
- The fire & rescue service will be notified immediately and the EA as soon as practicable.
- The burning item/area will be isolated and attempts to extinguish the fire utilising the on-site fire extinguishers will be made if safe to do so; and
- The site and buildings will be evacuated if the fire is not containable.

2.15 Loss of containment – Spillage and leakage

Loss of containment could lead to spillage and leakage of potentially contaminating liquids, e.g., fuel oil. To stop loss of containment and reduce the risk and impact of releases the following measures will be put in place:

- *Containment system:* any facilities for the storage of oils, fuels or chemicals will be sited above ground on impervious bases and surrounded by impervious bund walls. The volume of the bunded compound will be at least the equivalent to the capacity of the largest tank plus 10% or 25% of the total tank volume within the bund, whichever is the greater. All filling points, vents and gauges associated with the tanks will be located within the bund.
- *Storage tanks:* storage tanks will be constructed to the appropriate British Standard.

- *Inspection:* a daily, visual inspection of tanks by site staff to ensure their continued integrity, and to identify the need for any corrective action.
- *Spill kits:* materials suitable for absorbing and containing minor spillages will be maintained onsite; and
- *Monitoring techniques:* the site staff will undertake daily monitoring for evidence of spillage and leakage.

In the event of any potentially polluting leak or spillage occurring on-site, the following action will be taken:

- Minor spillages will be cleaned up immediately, using sand or proprietary absorbent. Any contaminated materials will be put into containers and transferred from site to a suitably permitted facility. The incident will be logged in the site diary.
- Dry wastes dropped on-site will be collected and taken to the appropriate area of the site.
- In the event of a major spillage, which is causing, or is likely to cause, polluting emissions to the environment, immediate action will be taken to contain the spillage and prevent liquid from entering surface water or drains. The spillage will be cleared immediately and placed in containers for off-site disposal. The EA will be informed.

2.16 Security and vandalism

The site will have the following security measures in place to prevent unauthorised access and vandalism:

- *Site perimeter:* the site will benefit from fencing around the perimeter;
- *Security gates:* the site access gate will be locked when the site is not in use;
- *Inspection:* the gate and fencing will be regularly inspected by the staff to identify any deterioration, damage or the need for any repairs;
- *Maintenance and repair:* the site fencing and access gate will be maintained to ensure their continued operation. Should any damage be detected, repairs will be made by the end of the working day. If this is not possible, suitable measures will be taken to

prevent any unauthorised access to the site and permanent repairs will be affected as soon as practicable and within 5 days;

- *Authorised access system:* all visitors to the site will be required to sign in in the visitor's book and then sign out on leaving the site to minimise the risk of unauthorised visitors being present on-site;
- *Monitoring techniques:* operational procedures, including regular inspections, will ensure continual monitoring of security provision at the site. In the event of a breach of security, the cause will be investigated, and suitable mitigation measures put into effect; and
- *Reporting:* records to be maintained include inspections and maintenance of security fencing and the gate, breaches of security, investigations and actions taken.

3.0 OPERATIONS

3.1 Overview

The landscape restoration plan describes how the quarry will be restored to existing contours once extraction has been completed. A section alongside the A12 will be progressively restored to levels that existed prior to the construction of the trunk road. The restoration of the quarry by the importation of inert backfill to original (predevelopment) contours will ensure that there are no long-term stability issues associated with mineral development following quarrying operations.

3.2 Operational hours

Other than for workshop and maintenance purposes and emergency use, the normal operating hours of the site will be:

0700 – 1800 Monday to Friday; and

0700 – 1300 Saturday.

The Site will not undertake operations on Sundays, Public or Bank Holidays

3.3 Operational phasing

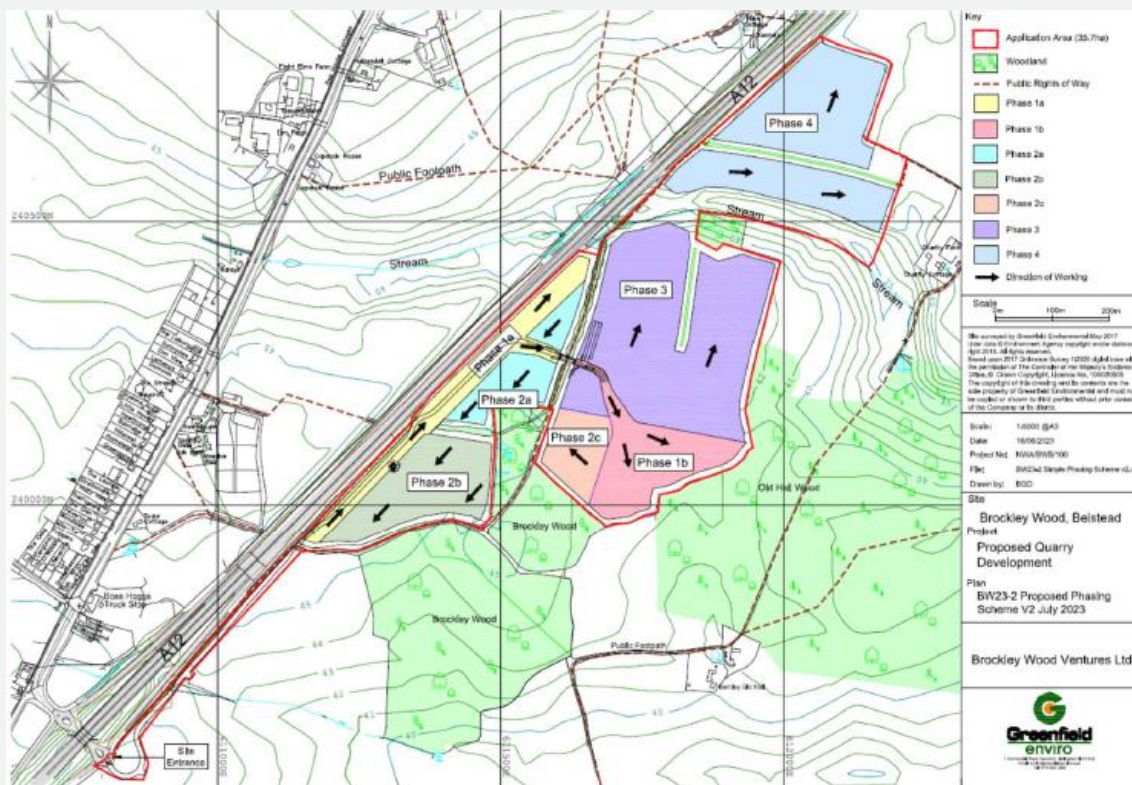


Figure 3-1: Proposed phasing scheme (BW23-2 v2 July 2023)

The restoration of the site will take place progressively during the operation phase of the development and immediately following the final extraction of minerals within Phase 4. Within each phase replacement of overburden, tipping and compaction will take place as soon as practical following extraction of minerals within that phase. Replacement of soils will only take place after completion of fill to the required formation levels and when appropriate weather and soil conditions permit in accordance with the submitted Soil Resources Assessment and Soil Movements Scheme. This will provide a suitably free drainage growing medium to allow the land to be returned to agricultural use.

The final profiles within each phase of the development are shown in sections A-A to E-E on Dwg Nos BW22-9 Restoration X-sections (South), BW22-10 Restoration X-sections (North) (Proposed Restoration Scheme) and on Dwg No.BW22-8 Restoration Contours. The proposal provides for the restoration of landform to its current contours adjusted so as to facilitate post restoration drainage to field edge ditches. The only exception is within the Phase 2a area which was subject to substantial excavation as part of the construction of the A12 diversion in the 1980's resulting in significant lowering of land levels. In this area, the bund and associated landscaping will be retained and levels over the Phase 2a area to the east will be raised to approximate the historic contours within this part of the site. The cross sections for this area are shown in BW22-3 A12 X-section.

On completion of mineral extraction within Phase 4, restoration of the Phase 4 area, plant area and haul road will remain to be undertaken. Consequently, there will be a period estimated at 2-3 years when the importation and process of inert waste will continue to enable this to be achieved. The operation of waste processing and wash plant will continue until the plant site is restored with final filling of the plant site and haul road undertaken by direct tipping and restoration of soils.

3.4 Construction (pre-operational) phasing plan

3.4.1 Phase 1a

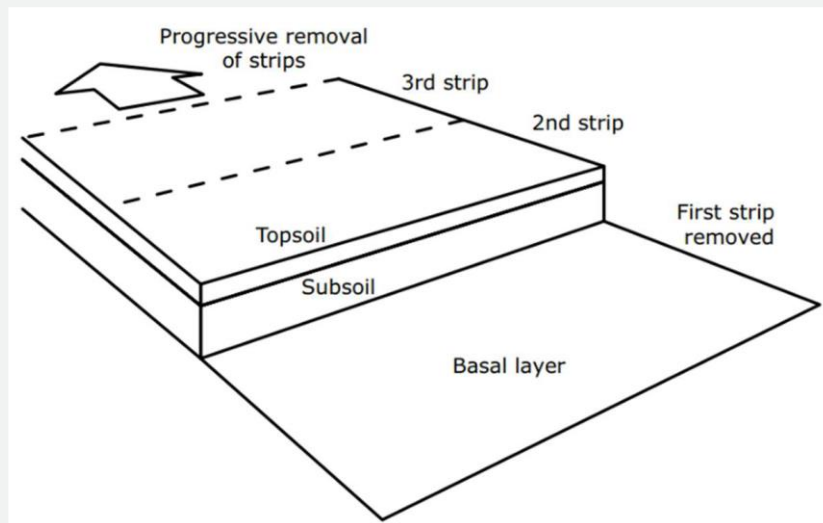


Figure 3-2: Soil stripping (courtesy of The Institute of Quarrying).

Phase 1a involves construction of the first stage of the haul road linking the access road and plant area together with the formation of the screen bund adjoining the A12, the siting of portacabin offices with adjoining weighbridges and office car park with floodlighting. In order not to sterilise mineral deposits, localised extraction of minerals will take place within the Phase 1a area in advance of construction work. This will be preceded by soil stripping and removal of overburden. The overburden will be used as fill and the haul road constructed above this at a level approximately 1m below existing ground levels. The roadside bund will be constructed to approximately 3m above existing ground levels adjoining the A12 using the overburden and surfaced in subsoil and topsoil to provide a suitable growing medium.

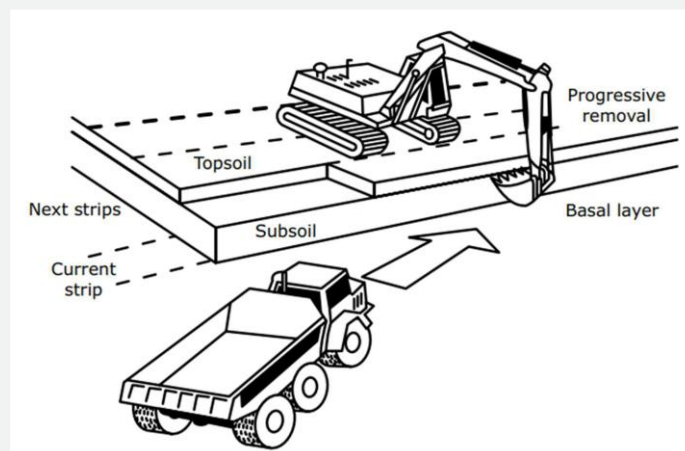


Figure 3-3: Topsoil stripping (courtesy of The Institute of Quarrying).

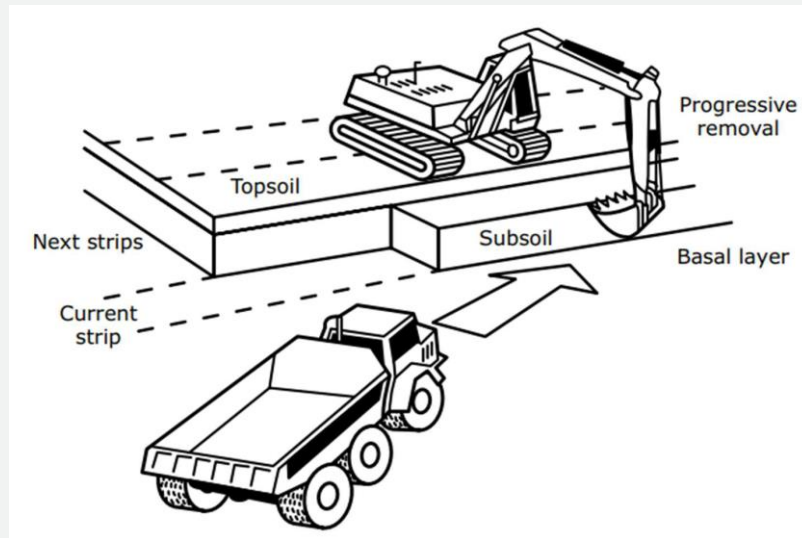


Figure 3-4: Subsoil stripping (courtesy of The Institute of Quarrying).

The first stage of the haul road follows an alignment which is initially 7m-10m away from the A12 boundary before passing behind the screen bund and then turning east to cross the central trackway at a point where the adverse impact on existing trees can be minimised. Sections showing the extent of cut and fill involved in this phase are illustrated in BW22-3 A12 X-section below.

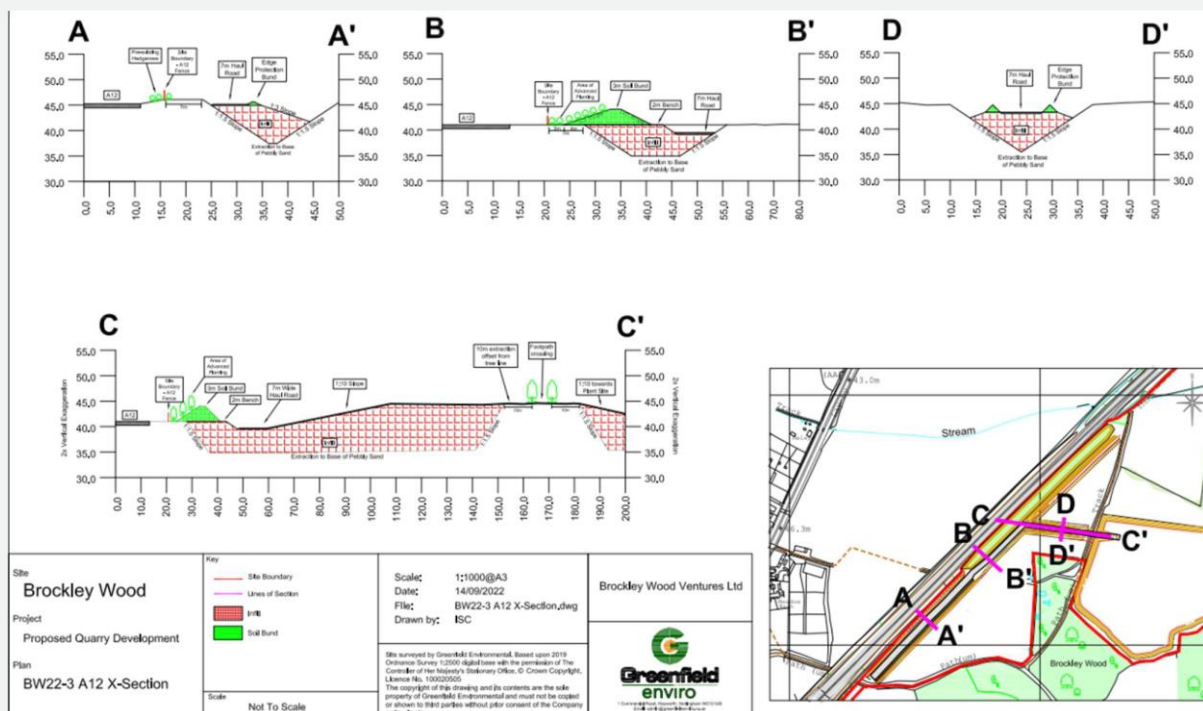


Figure 3-5: Phase 1a extent of cut and fill

The road will generally have a minimum width of 7m and will be constructed from as-raised or secondary consolidated aggregate and therefore will be permeable and free draining.

Where the road crosses the central trackway and for 10m on either side, the road will be at grade and will have a no-dig construction as recommended in the Arboricultural Assessment and maintained on the line of footpath FP27 to avoid undue disruption of the surface for pedestrians.

Landscaping of the A12 boundary adjoining Phase 1a will take place in the first planting season following the Phase 1a construction works. This will involve the formation of a roadside hedgerow approximately 700m in length and planting of the eternal, western slope of the bund adjoining Phase 2a.

3.4.2 Phase 1b

The proposed plant site occupies an area of approximately 4.0 ha centrally located within the site adjoining the southern boundary between Brockley Wood and Old Hall Wood. Phase 1b involves extension of the haul road to the east of the central trackway, provision of wheel-wash facilities for exiting vehicles and the excavation of the eastern part of the plant site (circa. 2.6 ha) following stripping of topsoil and subsoils.

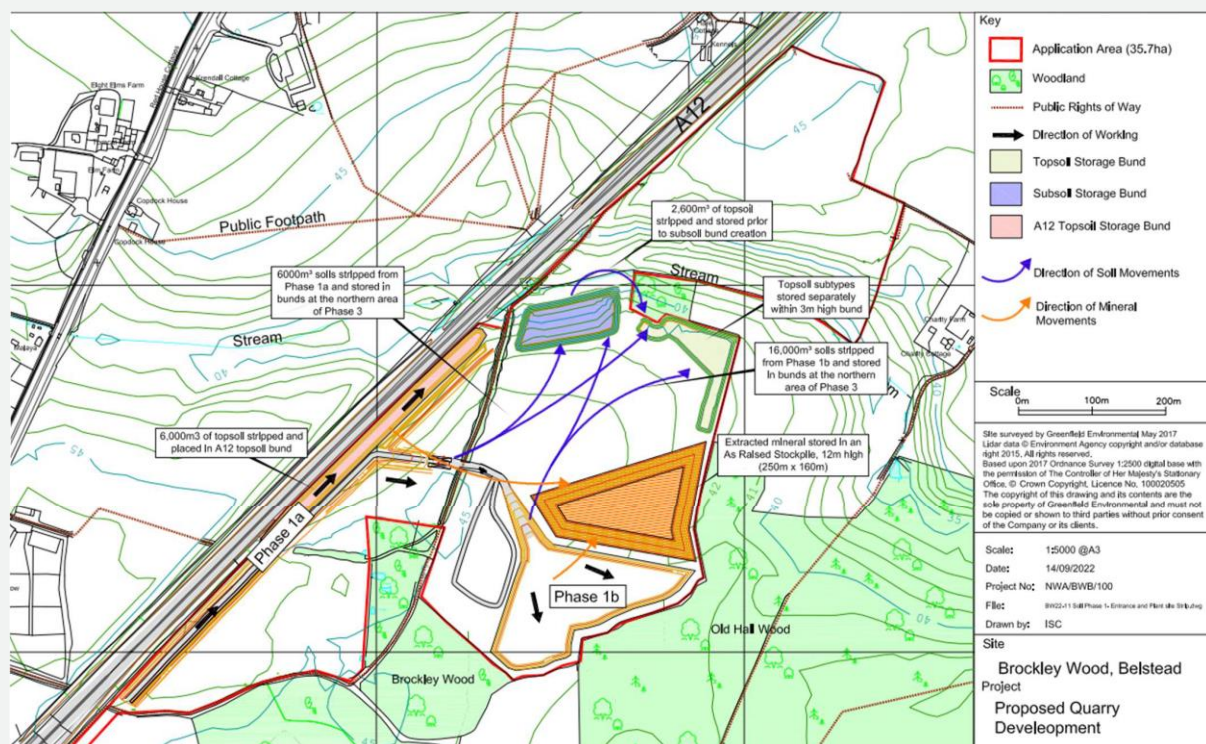


Figure 3-6: Phase 1b diagram

The floor of the plant site will be created by backfilling the void with overburden surface with consolidated aggregate at a level of 38.5m AOD which is between 3.5 – 6.5m below existing surrounding ground levels.

Following stripping of topsoil and subsoil the raised aggregate from the Phase 1 site operations will be stored in a stockpile immediately to the north of the Phase 1b area screened by Old Hall Wood to the east, Brockley Wood to the west and boundary hedgerows to the north-west and north. The eastern part of the Phase 1b will be used for the formation of lagoons for recycled water from the wash plant, silt settlement, receiving water and freshwater. The western part of Phase 1b will be used for the siting of the wash plant with storage silos to the south, both of which will be on a concrete base. There will be a circulation area around the wash plant facility for LGV traffic and for the operation of loading and unloading vehicles.

To minimise stockpiling, the processing of inert waste will take place initially at the upper level of the western part of the plant site area following the stripping of topsoil and subsoil. The waste processing plant will include a Trommel, Powerscreen screener and a Terex crusher and will be accessed by a temporary spur leading from the haul route to the western part of the plant site. This area will also accommodate a temporary lorry park for the applicant's haulage vehicles.

The plant site area will be enclosed by a 2.0 m high security fence erected on the upper level surrounding the working area. This will be inside the boundary trees and on the northern boundary it will follow the edge of the working area with gates at the points where it meets the haul road. The security fence will be adjusted to accommodate the change in levels when excavation of the Phase 3 area to the north commences. Additional landscaping will be undertaken to strengthen the boundary hedgerow linking Brockley Wood and Old Hall Wood.

3.4.3 Phase 2c

The construction phase of the proposed development will overlap the commencement of operational activities relating to the extraction of minerals and processing of inert waste. Phase 2c completes work on the formation of the plant site area which is anticipated will commence once extraction of minerals within Phases 2a and 2b has been substantially

completed. Excavation of this area will be undertaken incrementally with extracted minerals processed within the adjoining waste and wash plant without interim stockpiling and then either exported off-site or used for retail sales on site.

The soil and inert waste processing plant will be relocated to similar positions at the lower level which will be formed in the same way as Phase 1b at 38.5m OD. The proposed layout and interim profile of Phase 2c is illustrated in the plan and section shown in BW22-7 Plant Site Final Layout X-sections.

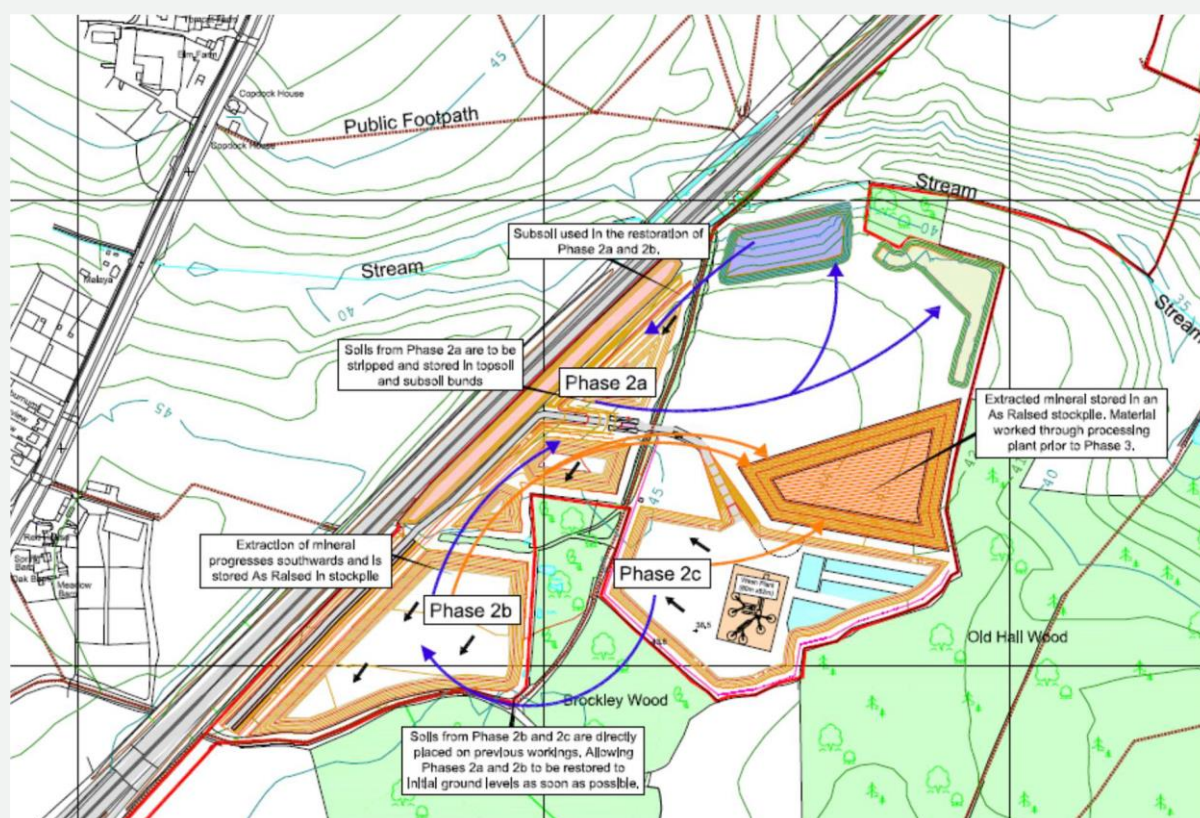


Figure 3-7: Phase 2 mineral extraction and stocking area

The final layout of Phase 2c will be accessed solely from the haul road at the lower level and there will be a circular route around the waste processing plant for vehicles using the workshop, lorry park and bagging building as well as for loading vehicles. Steps will be provided on the western boundary of the plant site area connected to a footpath at the upper level adjoining the western boundary of Phase 3, which will have lower-level lighting and will provide pedestrian access for staff between the plant site area and the site office.

3.5 Operational phasing

3.5.1 Phases 1a – 4

Based on borehole testing undertaken by Greenfield Enviro it is estimated that the application site contains approximately 2,794,000t net of saleable sand and gravel deposits. The void created by extraction of the minerals will be partly filled by the overburden, topsoil and subsoil from within each phase, i.e., extractive waste, but will leave a residual requirement for a total volume of 1,729,000m³ which, when using a bulk density conversion factor of 1.7t/m³, equates to approximately 2,939,300t of imported fill, i.e., non-extractive waste, to restore the site and achieve the full design finished contours. The position relating to the volume of sand and gravel, overburden, soils and inert fill in respect of each phase is set out in the Waste Recovery Plan (WRP).

The estimated rate of extraction per annum and length of extraction in respect of each phase is set out in the WRP. Based on these estimates, it is expected that the quarry will have an overall life of 15 years with the Phase 1a and 1b construction works being completed within 2 years and the completion of the Phase 2c construction work between year 2 and year 5. Access road construction will take place in parallel with the commencement of work on phases 1a and 1b, but the access road will not be used for either the export of aggregates or the import of waste other than for construction purposes until the work on the road is completed.

There will be a period of 2-3 years following completion of mineral extraction for the filling of the remaining void space and restoration of the site. All programme estimates are dependent on supply and demand which may vary over the life of the quarry.

In order not to sterilise viable minerals, the operational extraction of minerals will run in parallel with the construction phase as it is a prerequisite of the construction works. However, export of aggregates and concrete as well as retail sales from the site will not commence until the access road has been completed. Following completion of Phase 1b sand and gravel deposits across the site will be extracted in accordance with the phased programme shown in the Phasing Master Plan below. In each phase, including the construction phase, topsoil

and subsoil will be stripped and stored prior to the commencement of other operations, including stockpiling and bunding, and the use of dumper access routes.

The northern extremity of the Phase 4 area forms part of the current draft route for part of the Bury St Edmunds to Colchester Water Pipeline. If it emerges that there will be conflict between the pipeline proposals and the application proposals, it may be necessary to considering revised phasing arrangements to allow minerals to be extracted from within the affected area in advance of the current programme.

3.6 Material stockpiling

During the preliminary excavation process the overburden, consisting of topsoil and subsoil will need to be stripped to reveal the sand and gravel strata. So that it can be reused during the restoration phase it will be stored in large, temporary stockpiles to reduce the surface area occupied, and to prevent damage from the weather and other construction activities.

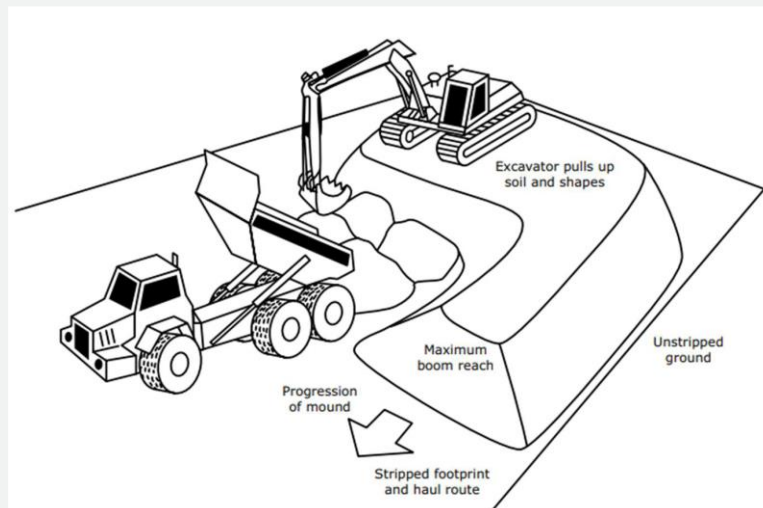


Figure 3-8: Soil stockpiling (courtesy of The Institute of Quarrying)

The main aim when temporarily storing soil in stockpiles is to maintain the soil quality and minimise damage to the soil's physical (structural) condition so that it can be easily reinstated once respread. In addition, stockpiling soil will not cause soil erosion, pollution to watercourses or increase flooding risk to the surrounding area.

As it is planned that the stripped soil will be stored for longer than a few weeks, it is understood that the core of a soil stockpile may progressively become anaerobic due to limited oxygen ingress. Under such conditions, temporary geochemical and microbiological

changes may occur, including the development of locally reducing environments and associated shifts in microbial community structure and metabolic pathways. These changes are typically reversible upon re-exposure to aerobic conditions and are not expected to pose a risk to receptors when managed in accordance with best practice stockpile design and maintenance protocols.

Storage of soils will take place in temporary bunds using dump trucks and excavators in accordance with DEFRA guidance and [Construction Code of Practice for the Sustainable Use of Soils on Construction Sites](#) as set out in the soil handling method statement. The movement and temporary storage of soils within the site will take place in a phased programme in accordance with Report 1882/1 – Soil resources and agricultural quality of land at Brockley Farm, Ipswich. The overburden will then be removed to allow extraction of the viable mineral deposits by a hydraulic excavator which will take place periodically on a campaign basis. The overburden will be used to progressively fill the void created and will form the base on which further imported inert waste can be deposited and compacted to achieve the required formation levels. Subsoil and topsoil will then be placed at the upper levels in accordance with the Soil Resources Report and the Soil Handling and Soil Movements Scheme during the summer months.

4.0 PROCESS DESCRIPTION AND MATERIAL IMPORT

4.1 Overview

Agricultural land requires soils with good structure and drainage which can be achieved using SS1 and SS2 as subsoils in the restored profile. Permeable fill should be overlain by at least 700 mm of subsoil (including at least 200 of SS2 as an upper subsoil). TS1 or TS2 should then be laid to a minimum thickness of 300 mm (see below).

This profile would give land of best and most versatile subgrade 3a agricultural quality.



Figure 4-1: Recommended restoration soil profile to 1.2m

4.2 Clay

These subsoils are weakly structured and would be difficult to reuse. They will be used as overburden or in structural landscaping (e.g., in the core of screening bunds) rather than as a soil restoration resource.

4.3 Subsoil

8.3.1 SS1 – Coarse and sandy loams

This resource comprises the subsoils of the coarse loamy soils. They typically comprise moderately stony coarse loamy and sandy soils that are of moderate quality for reuse in restoration. They should be stripped as required until gravel layer is reached, or up to 900 mm thickness.

8.3.2 SS2 – Medium loams

This resource comprises the upper subsoil layer of the medium loamy over gravel soils. They are of high quality for reuse if handled sensitively to avoid structural damage. To maintain resource quality, it is recommended that they be stripped to a standard thickness of 200 mm to avoid inclusion of underlying gravel.

4.4 Topsoil

8.4.1 TS1 – Coarse and medium loams

These are high quality topsoils for reuse in restoration. They will be stripped to a standard thickness of 300 mm and stockpiled separately from TS2/3.

8.4.2 TS2 – Fine loams

These topsoils are moderate quality resources for reuse in restoration due to their high clay content which makes machinery handling relatively difficult. They will be stripped to a standard thickness of 300 mm and stockpiled separately from TS1.

4.5 Suitable imported materials

Suitable inert materials and clean soils will be imported to site at a maximum rate of 250,000 t/yr. All vehicles carrying waste will report to the Site Office/weighbridge for weighing and the following checks and procedures.

- Visual inspection to ensure the load complies with the description provided on the Waste Transfer Note.
- New drivers will be informed of Site safety procedures.
- The relevant paperwork, including Duty of Care, will be inspected; and
- The registration of the carrier will be checked.

At this stage, if the load is compliant, the driver of the vehicle will be directed to the relevant area to discharge their load, with a secondary visual inspection taking place. Random samples of waste will be collected by the site operatives for confirmatory testing.

4.6 Waste Characterisation

Wastes entering sites will undergo a three-tier testing protocol as detailed below:

Level 1: Basic Characterisation. This is a thorough determination, according to consistent analysis and behaviour testing methods of the short- and long-term leaching behaviour and/or characteristic properties of the waste.

Level 2: Compliance Testing. This is periodical testing by simpler standardised analysis and behaviour testing procedures to establish whether the waste follows permit conditions and any specific restoration material requirements. This assessment will focus on important variables and behaviour identified by basic characterisation and will be carried out at least annually.

Level 3: On-site verification. This establishes rapid check methods to verify that a waste is the same as that which was been subjected to compliance testing and that which is described in the documentation accompanying the waste. It may consist merely of a visual inspection of the waste before and/or after unloading.

A visual inspection to satisfy the Level 3 on-site verification requirements will be carried out on all wastes deposited at the site whether within the LGV or during/after deposit.

All waste accepted for recovery, or treatment at the on-site facility, will be accompanied by a WTN as required by DoC Regulations and checked by the weighbridge operator before the vehicle is permitted to access the site.

A register of the quantities and characteristics of waste accepted at the site will be maintained on a computerised database. A record will also be maintained of all waste that is removed from the facility.

A quarantine area will be located within the operational site area, where any non-conforming loads identified following discharge will be segregated pending additional investigations.

4.7 Waste that does not need testing

In line with [Waste acceptance procedures for deposit for recovery - GOV.UK](https://www.gov.uk/guidance/waste-acceptance-procedures-for-deposit-for-recovery) waste producers do not need to test their waste (except for testing it for classification), if they are in the following list of waste codes and:

- Come from a single source
- Are well characterised and described
- Carry no risk of contamination, for example from a site that has not previously been developed.

Table 4-1: List of waste codes that do not need analysis (where authorised):

EWC code	Description
01 01 02	waste from non-metalliferous excavation
01 04 08	waste gravel and crushed rocks other than those containing dangerous substances
01 04 09	waste sand and clays
10 12 08	waste ceramics, bricks, tiles and construction products (after thermal processing)
17 01 01	concrete
17 01 02	bricks
17 01 03	tiles and ceramics
17 01 07	mixtures of concrete, bricks, tiles and ceramics
17 05 04	soil and stones
19 12 09	minerals (for example, sand and stones)
20 02 02	soil and stones

However, if it is considered that the waste may potentially be contaminated and the waste producer has not provided any analysis results to disprove this, the waste will be rejected.

4.8 Import of materials for direct use

Where materials are pre-assessed suitable for direct use in the restoration phase, they will undergo the three-tier testing protocol as detailed in the Waste Acceptance Procedures. They will then be directed to the working area, or to the appropriate, temporary stockpile.

The placement of soils to attain the agreed restoration contours will follow two different methods.

4.8.1 Subsoil

Subsoil is a weathered soil layer extending between the natural topsoil and the little weathered basal layer (e.g., geological parent material) below, or similar material within a landscaping project on to which topsoil can be spread. Subsoil usually has a lower organic matter and plant nutrient content than topsoil.

4.8.2 Topsoil

Upper layer of a soil profile, usually darker in colour and more fertile than the layer below (subsoil), and which is a product of natural biological and environmental processes. The thickness of natural topsoil will vary from only a few centimetres in some sites to more than 0.35m in deeply cultivated agricultural sites.

4.9 Import of manufactured soils

Manufactured soils will be imported under EWC 19 12 12 soil substitutes [A material produced by combining mineral matter and organic matter of suitable quality (and, where appropriate, fertiliser and lime) that provides similar functions to natural topsoil] and will only be accepted from the on-site waste recycling facility.

The specifications below provide the maximum threshold levels of toxic and phytotoxic elements which are allowable within the soils to be placed at the site, to ensure that the

placement of soils will not result in environmental pollution or harm human or plant health. They also provide the maximum organic matter content, measured as Loss on Ignition (LOI) and an acceptable range of pH.

Table 4-2: Substitute subsoil specification

Parameter	Unit	Value	Reference
Arsenic (As)	mg/kg	40	Former EA inert landfill guidance figure ICRCL derived
Cadmium (Cd)	mg/kg	15	Former EA inert landfill guidance figure ICRCL derived
Chromium (Cr)	mg/kg	1000	Former EA inert landfill guidance figure ICRCL derived
Copper (Cu)	mg/kg	500	
Lead (Pb)	mg/kg	870	
Mercury (Hg)	mg/kg	20	Former EA inert landfill guidance figure ICRCL derived
Nickel (Ni)	mg/kg	110	
Selenium (Se)	mg/kg	100	
Zinc (Zn)	mg/kg	1000	
TPH	mg/kg	1500	
Mineral oil	mg/kg	500	Conservative value to protect watercourses, mineral oil level more relevant
PAH	mg/kg	100	Inert Waste Acceptance Criteria (WAC)
PCB	mg/kg	1	Inert Waste Acceptance Criteria (WAC)
BTEX (Sum)	mg/kg	6	Inert Waste Acceptance Criteria (WAC)
Loss on Ignition (LoI)	mg/kg	2	Inert WAC and British Standard Specification for Subsoil and Requirements for Use (BS 8601-2013)
pH	%	5-9	Inert Waste Acceptance Criteria (WAC)

Table 4-3: Substitute topsoil specification

Parameter	Unit	Value	Reference
Arsenic (As)	mg/kg	40	Former EA inert landfill guidance figure ICRCL derived
Cadmium (Cd)	mg/kg	15	Former EA inert landfill guidance figure ICRCL derived
Chromium (Cr)	mg/kg	1000	Former EA inert landfill guidance figure ICRCL derived
Copper (Cu)	mg/kg	500	
Lead (Pb)	mg/kg	870	
Mercury (Hg)	mg/kg	20	Former EA inert landfill guidance figure ICRCL derived
Nickel (Ni)	mg/kg	110	
Selenium (Se)	mg/kg	100	
Zinc (Zn)	mg/kg	1000	
TPH	mg/kg	1500	
Mineral oil	mg/kg	500	Conservative value to protect watercourses, mineral oil level more relevant
PAH	mg/kg	100	Inert Waste Acceptance Criteria (WAC)
PCB	mg/kg	1	Inert Waste Acceptance Criteria (WAC)
BTEX (Sum)	mg/kg	6	Inert Waste Acceptance Criteria (WAC)
Loss on Ignition (Loi)	mg/kg	2	Inert WAC and British Standard Specification for Subsoil and Requirements for Use (BS 8601-2013)
pH	%	5-9	Inert Waste Acceptance Criteria (WAC)

Manufactured topsoil will also be required to fall within the accepted textural parameters within BS3882:2015 as shown below.

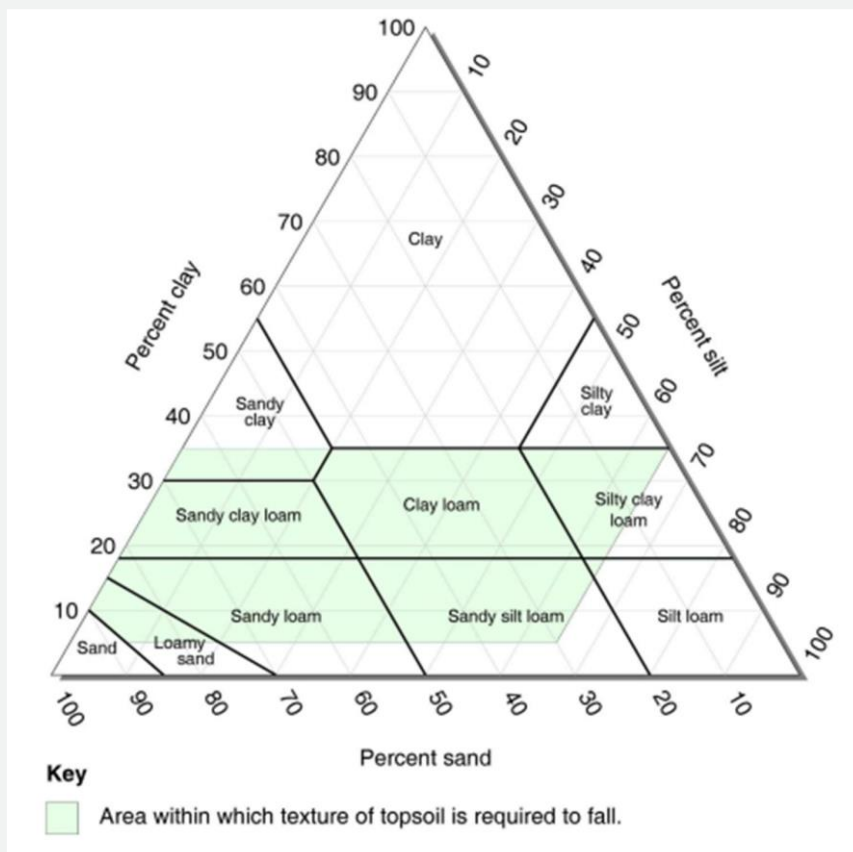


Figure 4-2: BS3882:2015 textural class

5.0 SOIL REPLACEMENT

5.1 Overview

Current government policy is that all reclamation (restoration and aftercare) agricultural schemes should be to high standards. For agricultural after uses, the best available practice (i.e., least risk) is using the excavator dump truck combination in conjunction with the bed system. With the anticipated effects of climate change on soils, it is important the soil resource is safeguarded whatever its quality grading due to the range of ecosystem services it can provide in addition to agricultural production, e.g., water storage, flood mitigation, carbon storage and greenhouse gas regulation etc.

Additional cultivations may be necessary (such as the creation of a seedbed and reduction in the surface stoniness) following the replacement of the soil profile and completion of remedial works for decompaction and stone/artefact removal. It is expected that these would be of a type relevant to the after use.

It is important for a vegetation cover to be established (this could be one of the many commercially available cover crop mixes available) as soon as possible and in sufficient time before the growing season ends to protect the soil surface and minimise slumping of the loosened soil profile, attenuate surface runoff and to initiate soil recovery processes. The extent of soil replacement should not usually exceed the capability of establishing an effective vegetation cover. It should be undertaken progressively as soon as the replacement operations and final cultivations are completed to avoid the soil surface remaining bare and unprotected by vegetation over the winter with the high risk of loss of soil from wind and water erosion and weed colonisation.

The following are illustrations of methods undertaken for the backfilling of the void to the agreed final planning contours.

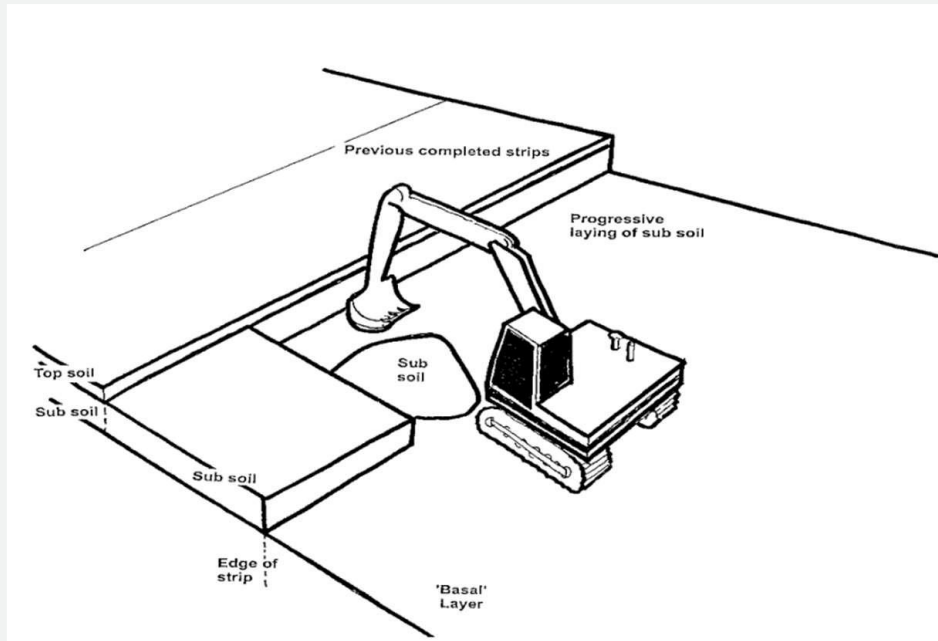


Figure 5-1: Subsoil replacement with excavators and dump trucks (courtesy of The Institute of Quarrying)

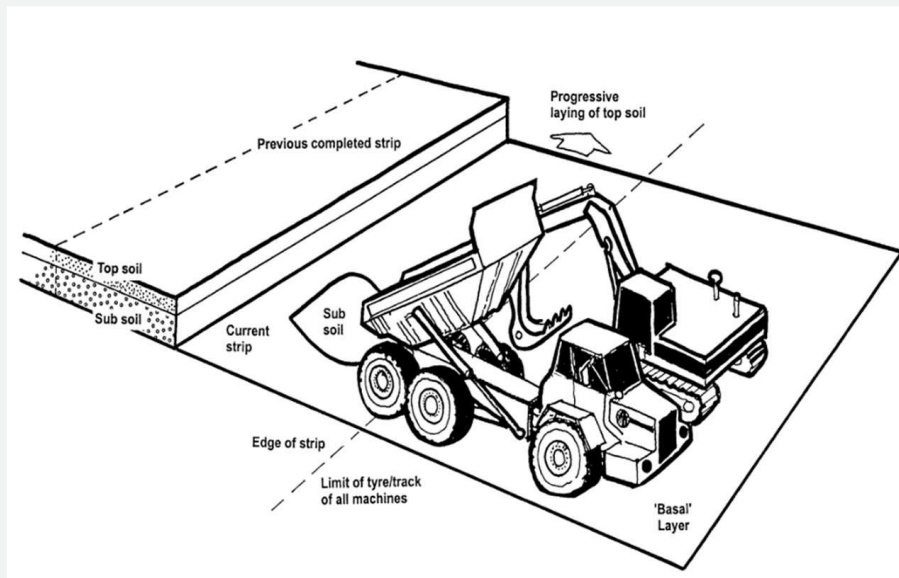


Figure 5-2: Topsoil replacement with excavators and dump trucks (courtesy of The Institute of Quarrying)

6.0 FINAL SITE RESTORATION

The restoration of the site will take place progressively during the operational phase of the development and immediately following the final extraction of minerals within Phase 4. Within each phase, replacement of overburden and tipping and compaction will take place as soon as practical following extraction of minerals within that phase. Backfilling of soils will only take place after completion of fill to the required formation levels and when appropriate weather and soil conditions permit in accordance with the Soil Resources Assessment and Soil Movements Scheme. This will provide a suitably free drainage growing medium to allow the land to be returned to agricultural use.

The final profiles within each phase of the development are shown in sections A-A to E-E on P1946-BW21 Proposed Restoration Scheme Cross Sections and P1946-BRKW 2022 Site Plan Restoration Contours. The proposal provides for the restoration of landform to its current contours adjusted to facilitate post restoration drainage to field edge ditches. The only exception is within the Phase 2a area which was subject to substantial excavation as part of the construction of the A12 diversion in the 1980's resulting in significant lowering of land levels. In this area, the bund and associated landscaping will be retained and levels over the Phase 2a area to the east will be raised to approximate the historic contours within this part of the site.

On completion of mineral extraction within Phase 4, restoration of the Phase 4 area, plant area and haul road will remain to be undertaken. Consequently, there will be a period estimated at 2-3 years when the importation and processing of suitable waste streams will continue to enable this to be achieved. Within the plant site, the operation of waste processing and wash plant will continue until the plant site is restored with final filling of the plant site and haul road undertaken by direct tipping and restoration of soils.

6.1 Ecology and Landscape Management Plan

The Ecology and Landscape Management Plan (E&LMP) sets out measures designed to maintain and enhance biodiversity across the site and adjoining woodland under the control of the applicant company over the life of the quarry and for a period of 5 years following

cessation of quarry operations. It will govern the implementation of the approved landscaping scheme in accordance with a phased programme and measure undertaken annually relating to the cultivation, weeding and management of landscaped areas and the phased introduction of measure to mitigate ecological impacts and to enhance long-term biodiversity across the site.

6.2 5-Year Aftercare Plan

The 5-Year Aftercare Plan will incorporate the E&LMP but will also address those areas of the site intended to be returned to agricultural use. It will be designed to return all areas within the site other than those which form woodland, wooded trackways, field boundaries or agricultural access tracks to arable farmland and will include measure relating to:-

- replacing retained soils and subsoils to appropriate depths and profiles
- facilitating drainage of restored areas by provision of drainage ditches
- maintenance of field profiles
- cultivation, weeding and treatment of restored areas
- monitoring, recording and, where necessary, modifying aftercare measures.

6.3 Closure

After mining waste operations have ceased at the site, the Environmental Permit will continue to be in force to control the ongoing pollution risks associated with the mining waste facility. Monitoring of the mining waste facility, and associated restoration activity, will continue until such time as it is considered that the mining waste facility no longer poses a risk to the environment or human health and the restoration and aftercare has been satisfactorily carried out.

When it is demonstrated that the mining waste facility no longer poses an unacceptable risk to the environment or human health, an application will be made to surrender the permit.