

SIRIUS MINERALS PLC - DISCHARGE OF PLANNING CONDITIONS FOR PLANNING APPLICATION NYM/2014/0676/MEIA, THE NORTH YORKSHIRE POLYHALITE PROJECT

CONDITION	NYMNP 76
REPORT	SOIL MANAGEMENT PLAN
SITE	PHASE 4 WORKS WOODSMITH MINE, NORTH YORKSHIRE
DOCUMENT NUMBER	40-FWS-WS-70-CI-PL-0003Rev1

1433DevOR209Rev1/May 2017

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PROJECT NUMBER	1433	
PROJECT TITLE	THE NORTH YORKSHIRE POLYHALITE PROJECT	
CLIENT	SIRIUS MINERALS PLC 7-10 Manor Court Manor Garth SCARBOROUGH YO11 3TU	
REPORT TITLE	WOODSMITH MINE PHASE 4 WORKS SOIL MANAGEMENT PLAN	
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WOODSMITH MINE PHASE 4 WORKS SOIL MANAGEMENT PLAN

1 INTRODUCTION

1.1 General Background

This document has been prepared on behalf of Sirius Minerals PLC (Sirius Minerals) and provides the Soil Management Plan for the Phase 4 Works at Woodsmith Mine (Phase 4 Works). This is required to satisfy the requirements of Condition 76 of Planning Permission NYM/2014/0676/MEIA.

This Soil Management Plan has been developed for the scope of the Phase 4 Works as defined in Section 1.2. The Soil Management Plan will be updated and re-submitted in advance of all subsequent development phases.

The soils handling procedures adopted as part of these works will comply with the industry guidance set out in:-

- Defra (2009) Construction Code of Practice for the Sustainable Use of Soils on Construction Sites (Ref. 1).
- Defra (2005) Guidance for Successful Reclamation of Mineral and Waste Sites (Ref. 2).
- MAFF (2000) Good Practice Guide for Handling Soils (Ref. 3).

1.2 Summary of Phase 4 Works

Works Completed as Part of Phase 4

A summary description of the principal construction elements of the Phase 4 Works is presented below with reference to the Arup design drawings (Drawings No 40-ARI-WS-71-CI-DR-1081 and 40-ARI-WS-71-CI-DR-1082):-

- Operation of the concrete batch plant;
- Installation, commissioning and operation of the bentonite plant;
- Installation of concrete guide walls (excavate to -3.5m and concrete wall down to -1.5 to -1.75 m);
- Mobilisation to site of diaphragm walling equipment (cutters, cranes, workshops etc.);
- Diaphragm wall construction to -60m below ground level at the Production, Service and Mineral Transport System shafts;
- Limited continuation of earthworks to create an area for future storage of spoil, including soil stripping to extend permanent Bund A (No. 19) in the northwest, extend temporary topsoil and subsoil bunds (No. 22 and 23) in the northeast and construct inert temporary soil mound (No. 21) to the south of the Batch Plant platform, as shown in Arup Drawing 40-ARI-WS-71-CI-DR-1082.

The Phase 4 Works will be undertaken between July 2017 and March 2018.

1.3 Compliance with Conditions

The table below sets out the wording of Planning Condition 76 and details where the relevant material to comply with this condition as relevant to Phase 4 only, has been provided within this report:-

NYMNP	Compliance with Condition 76
Prior to commencement of preparatory works an updated soil management plan shall be submitted to the MPA for approval. This shall set out any circumstances during which soil handling is to be avoided and shall include the following measures:-	This document, for Phase 4 only.
Soil shall be moved when it is in a dry and friable condition as defined in Chapter 16 of the York Potash Environmental Statement (September 2014 as updated by the supplementary Environmental Statement dated February 2015) and shall not be moved between 1 October and 31 March unless agreed in writing by the MPA.	Section 4.
All topsoil and subsoil stripped from the surface area of the development shall be retained on site.	Section 4.
No plant or vehicle shall cross any area of un-stripped topsoil except if essential and unavoidable for the purpose of permitted operations.	Section 4.
No part of the site shall be used for a road or for the stationing of plant or buildings until all available topsoil and subsoil have been stripped from that part.	Section 4.
Soil handling will be in accordance with the "Construction Code of Practice for the Sustainable Use of Soils on Construction Sites (DEFRA 2009)" and appropriate steps shall be taken to prevent the spread of soil-borne or animal diseases.	Section 6.
Any soil or spoil storage mounds that are to be in place for a period of more than three months are to be grass hydroseeded within four weeks of substantial completion with seed mix agreed by MPA. At all times during the construction period the approved updated soil management plan shall be adhered to.	Section 4.

2 SOIL RESOURCES AND LAND QUALITY

2.1 General

A detailed soil survey was undertaken by Land Research Associates in May 2014 (Ref. 4). This found that the Woodsmith Mine site contained thin clayey loamy topsoil across the site underlain by predominantly heavy clay subsoils.

2.2 Topsoil

Three principal topsoil types are reported on site comprising medium and heavy clay loams and woodland soils, as illustrated on Drawing 1433DevOD262, for which the average soil thicknesses are shown in Drawing 1433DevOD263.

Medium Clay Loam Soils

Over the majority of the central and northern parts of the Doves Nest Farm site, the topsoil is recorded as medium clay loams with a minimum thickness of 0.14 m, a maximum thickness of 0.50 m, and an average thickness of 0.26 m. The topsoil structure comprises a friable very dark greyish brown medium clay loam with a well-developed medium to coarse sub-angular blocky structure, which has an abrupt smooth boundary with the underlying subsoils.

Heavy Clay Loam Soils

In the west and northeast there are three areas of heavy clay loam topsoil, with a minimum thickness of 0.17 m, a maximum thickness of 0.35 m, and an average thickness of 0.25 m. This topsoil comprises a dark greyish brown heavy clay loam with many distinct fine red root channel mottles. It is very slightly stony and has a moderately developed coarse sub-angular blocky structure and is friable to firm with an abrupt smooth boundary with the underlying subsoil.

Woodland Soils

Woodland soils are present over the southeastern third of the site within Haxby Plantation. They are often peaty/organic, but can also be medium to heavy clay loam and sandy loam soils. They have a minimum thickness of 0.11 m, a maximum thickness of 0.48 m, and an average thickness of 0.23 m. This friable stone less soil has a moderately well-developed sub-angular blocky structure, which has an abrupt smooth boundary with the underlying layers.

2.3 Subsoil

The soil survey (Ref 4) identified upper and lower subsoils onsite, as detailed below.

The upper subsoil is principally a medium clay loam, although it is reported to vary in texture from clay and medium to heavy clay loams, through to sandy clay loams and loamy medium sand soils. The subsoil base varies in depth from 0.25 m to greater than 1.0 m below ground level (bgl) with an average depth to base of 0.54 m bgl.

The lower subsoil varies in texture from a medium / heavy clay loam to a sandy clay loam, but is predominantly a heavy clay loam and has a greater clay content than the upper subsoils. Its base is generally at a depth of greater than 1 m bgl.

2.4 Soil Resource Type and Quantities

The soil resource types to be encountered within the boundary of the Phase 4 Works are illustrated in Drawing 1433DevOD262 and include topsoil and subsoil, as described below for which the volumes of soils to be moved are presented in Arup's earthworks strategy Drawing No 40-ARI-WS-71-CI-DR-1082.

Topsoil

The heavy clay loam and medium clay loam topsoil are classified as moderate quality (Ref. 4) and will be treated as a single resource for stockpiling and reuse.

Subsoil

The variable upper and lower subsoils present across the whole site will be treated as a single resource (Ref. 4). Isolated pockets of more granular subsoils are locally present onsite and where practicable, these sandier subsoil materials will be stockpiled separately for reuse during wet periods.

3 SUMMARY OF RESTORATION AND ENDUSE

During the Phase 4 Works permanent restoration will only be undertaken of the extended Bund A to establish scrub vegetation on top of 0.15m of topsoil overlying 0.6m of subsoil, as shown on Arup Drawing 40-ARI-WS-71-CI-DR-1082.

The temporary stockpiles of topsoil, subsoil and Class 2 Cohesive General Fill shown on Arup Drawing 40-ARI-WS-71-CI-DR-1082 that are to be retained for greater than three months will be seeded within four weeks of completion.

The surface restoration for the remainder of the Phase 4 Works will include areas of temporary hardstanding (i.e. within the working platform and bentonite plant area), as shown on Arup Drawing 40-ARI-WS-71-CI-DR-1081.

4 SOIL HANDLING

4.1 General

Condition 76 states that soil shall be moved when it is in a dry and friable condition and shall not be moved between 1 October and 31 March unless agreed in writing by the Minerals Planning Authority (MPA). This section sets out the proposed method for defining when soil is in a dry and friable condition and can, therefore, be handled on site, including between the period 1 October and 31 March. Where soil materials are to be handled within the period of 1 October and 31 March, the Environmental Engineer's report on soil characterisation and acceptability testing, compiled in accordance with Section 7 of this Soil Management Plan, shall be submitted to the MPA for its approval in advance of these works.

A suitably qualified Environmental Engineer will be appointed to audit and direct the handling of soils within the Phase 4 Works.

Topsoil and subsoil will be stripped, handled, stored and replaced in accordance with the Ministry of Agriculture, Fisheries and Food (MAFF) and the Department for Environment, Food and Rural Affairs (Defra) guidance (Refs. 1 and 3). All topsoil and subsoil materials will be stripped and stockpiled separately.

Soil handling procedures, during stripping, storage, re-spreading and seeding, will be adopted to avoid mechanically induced physical degradation of the soils. To minimise the risk of soil handling causing mechanically induced physical degradation to the soil structure during wet conditions, the procedures outlined in Sections 4.3 to 4.8 are to be adopted in terms of acceptability testing, stripping, stockpiling and placement.

4.2 Plant, Compound and Haulage Roads

Plant involved in the construction and operation of the concrete batching and bentonite plant areas have been excluded from this assessment because these vehicles will only travel on the constructed Welfare Road and Shaft Platforms and will not traffic on areas of exposed soils.

The proposed plant that will be used during the soils management and earth moving operations as part of the Phase 4 Works includes:-

- 30 Tonne Excavators.
- 30 Tonne Dumpers.
- Dozers.
- 20 Tonne Rollers.
- Tractor & bowser.
- Mobile crushers.
- 8 Wheel and articulated lorries
- Fuel tanks (10,000 litres).

The locations of the compound and haulage roads, as shown on Arup Drawing 40-ARI-WS-71-CI-DR-1081, will meet the requirements of the Planning Conditions, and the minimum requirements of the MAFF and DEFRA guidance (Refs. 1 and 3). As such, no plant or vehicles will cross any area of un-stripped topsoil except as essential and unavoidable for the purposes of permitted operations. The topsoil will be stripped from beneath all temporary haul roads and plant compounds. The topsoil and subsoil will be stripped from beneath all permanent roads and permanent areas for the stationing of plant and buildings.

4.3 Acceptability Testing

Characterisation Testing

Prior to soil stripping, characterisation testing will be carried out by the Environmental Engineer to determine the grading and textural classification in accordance with BS 3882:2015 and the plasticity range specific to the principal topsoil and subsoil materials present on site.

Representative samples of the clayey topsoil and subsoil materials will be taken to a depth of 0.6 m at a minimum frequency of 1 sample per 2,000 m³ and tested for grading, moisture content and plastic limit in accordance with BS 1377 Part 2.

Review of the testing on topsoil and subsoil materials will be undertaken to characterise the textural classification of the soils in accordance with BS 3882:2015, as illustrated in Drawing 1433DevOD214. For clay soils a characteristic upper bound acceptable moisture content limit will be derived by consideration of the soil's plastic limit. For sandy soils, which can be placed at a range of moisture contents without causing physical damage to the soil structure, no upper bound moisture content will be applied.

Acceptability Testing

Acceptability testing will be undertaken by the Environmental Engineer on all clay topsoil and subsoil materials within 1 day prior to earth movements at a frequency of 1 sample per 500 m³ of material. Prior to handling of clay dominant soils, the Environmental Engineer will confirm that the soil's moisture content is below the acceptable moisture content limit derived by consideration of the soils plastic limit.

4.4 Vegetation Clearance

The purpose of vegetation removal prior to topsoil stripping is to prevent anaerobic decay of vegetation occurring when incorporated within the topsoil or subsoil stockpiles or landscape bunds.

Surface vegetation within the working area will be removed from grassed, scrub and agricultural areas by blading off, by scarification and raking, or kill off by application of a suitable non-residual herbicide applied not less than two weeks before stripping commences. Within selected woodland areas trees will be cut down and removed, with the stumps removed.

4.5 Soil Stripping

Soil removal will be carried out prior to all main construction activities within an area, utilising earthmoving plant in accordance with (Ref. 3) and the Written Scheme of Archaeological Investigation.

As detailed in Section 4.3, handling of clay soils will only be permitted when it is reasonably dry and friable, which will be controlled by undertaking acceptability testing.

To avoid dilution of the topsoil with the underlying subsoil, topsoil will be stripped to the base of the unit, for which indicative depths are illustrated in Drawing 1433DevOD263.

Topsoil will be stripped from all areas of temporary and permanent works. Subsoil will be stripped from beneath the extended Bund A and Inert Temporary Storage Mound. The upper and lower clay loam subsoil will be stripped and stockpiled as one resource, as shown in Arup Drawing 40-ARI-WS-71-CI-DR-1082. However, if granular subsoils are identified during the site strip, these will, where practicable, be separated and stockpiled as an independent resource for reuse during periods of wet weather when other cohesive clay subsoils may fail the acceptability criteria.

The preferred method for minimising damage to soil is for stripping to be undertaken in accordance with the bed/strip system as detailed in current guidance (Refs. 1 and 3).

During periods of heavy prolonged rainfall and soon after it ceases, there will always be surplus water in the surface layers of the soil. During these periods, soil handling will be suspended to prevent the surface layer from becoming compacted or rutted and to permit any further rain to drain away as quickly as possible. After rainfall, the moisture content of the soil will be re-checked by the Environmental Engineer prior to recommencing mechanised soil handling in accordance with Section 4.3.

The topsoil and subsoil will be stockpiled separately from the other soils or engineered fill arising on the site.

Detailed daily records will be kept by the Contractor of operations undertaken, characterisation and acceptability testing and of the weather and soil conditions. A summary record of these operations, conditions and testing will be compiled and included within the Environmental Engineer's weekly inspection report, as detailed in Section 7.

4.6 Soil Stockpiling

Existing temporary topsoil and subsoil stockpiles constructed as part of the Phase 3 works will be used to accommodate the soils generated from the Phase 4 Works, as shown in Arup Drawing 40-ARI-WS-71-CI-DR-1082.

Topsoil and subsoil stockpiling will be undertaken in accordance with industry guidance (Refs. 1 and 3). Topsoil stockpiles will not exceed 3 m high and subsoil stockpiles will not exceed 7 m high. Side slopes will be no steeper than 1 in 2.

To construct soil stockpiles, dumper trucks will back tip each soil load into the stockpile area, starting from furthest point of access. A backacter will be used to form the soil into a mound, and while standing on the mound will progressively shape and form the sides, to promote shedding of rain. The process is repeated by tipping soil against the forming mound. No wheeled vehicles will be permitted to traverse on previously tipped material. Dump trucks will only be permitted to stand and travel on the basal layer for single tier mounds, and the soil mound height will be maximised prior to trucks accessing the upper surface in multi-tiered mounds.

Temporary stockpiles that are to be in place for more than 3 months will be seeded with grass, to minimise soil erosion and to help reduce infestation by nuisance weeds. Management of weeds will be undertaken during the summer months, either by spraying to kill them or by mowing or strimming.

4.7 Haul Roads

Haul roads constructed as part of the Phase 2 and 3 works will be utilised in this phase of the mine site construction.

4.8 Soil Placement

Soil placement will be undertaken by loose-tipping methods, as detailed in (Refs. 1 and 3).

Excavation from Soil Storage Stockpiles

A hydraulic excavator, fitted with a toothed-bucket will be used to load the soil materials from the source area or stockpile into a dump truck, which will then discharge it onto the receiving surface. Where the soils are to be directly replaced without storage in mounds, the initial strip of the upper horizons will be stored temporarily to release the lowest layer and enable the sequential movement of materials. The stored initial soil material will be placed on the lower layer removed from the final strip at the end of the programme or on partially completed profiles, if rain interrupted the operation.

Soil Placement

An excavator standing next to the newly dropped soil will spread this to the required thickness, restoring the whole length of each strip with subsoil prior to placement of topsoil, with the excavator avoiding travelling on the newly placed subsoil. Alternatively a low ground pressure dozer may be utilised to spread the topsoil. If the soil is cloddy in structure, the excavator bucket will be used to break up the clods and to remove large stones.

The soil layers above the base/formation layer will be replaced in sequential strips with the subsoil layers replaced first, followed by the topsoil layer to the layer thicknesses detailed below. The next strip will not to be started until the profile in the current strip is completed as in a bed or strip system.

Prior to commencing operations, a Meteorological Office forecast will be obtained to determine that soil replacement can proceed without interruptions from rainfall events. If significant rainfall occurs during operations, the replacement will be suspended, and where the soil profile has been started it will be replaced to topsoil level.

Soil Thickness

As part of the Phase 4 Works, the thickness of soil placed to restore scrubland vegetation will comprise 0.15m topsoil underlain by 0.6m of subsoil. Grassland will comprise 0.3m topsoil underlain by 0.2m of subsoil.

Relief of Compaction

Prior to spreading soil, the Environmental Engineer will inspect for compaction and panning and, where necessary, the substrate will be decompacted using a tractor-drawn subsoiler or ripper. This will only be carried out when the soil is sufficiently dry to the full depth of working.

4.9 Soil Cultivation and Seeding

After re-spreading topsoil, large, compacted lumps will be broken down by appropriate cultivation to produce a fine tilth suitable for planting (<40 mm) and seeding (<10 mm).

As part of the Phase 4 Works, both the extended permanent Bund A and inert temporary soil mounds will be seeded within 4 weeks of completion with the temporary seed mix detailed in the table below. The seed mix will be applied at a minimum rate of 25 gms/m², as agreed during the planning application process.

Botanical Name	Common Name	% by weight
Crystal	Hard Fescue	30
Disco	Perennial Ryegrass	25
Franklin	Strong Creeping Red Fescue	20
Panduro	Smooth Stalked Meadow Grass	10
Highland	Browntop Bent	10
Huia	White Clover	5

4.10 Soil Aftercare

Soil aftercare will be undertaken in accordance with the Landscape and Ecological Management Plan to meet with the requirements to discharge NYMNP A Planning Condition 57.

The maintenance will include monitoring of the soil conditions to identify unsatisfactory growing conditions by hand digging small trial pits or augers at representative locations 2 to 3 times during each year, and a few weeks after planting. Annual meetings will be held between Sirius Minerals and the MPA and other interested parties to ensure that aftercare is successful, and a pre-release report will be issued to demonstrate that the land has been reclaimed to the required standard.

Full details of the soil aftercare strategy will be presented in subsequent revisions of this document for the discharge of Planning Condition NYMNP A 76 for the complete mine site development.

5 PREVENTION OF EROSION

The following erosion management measures will be adopted during the Phase 4 Works:-

- The extent of bare soil left open will be minimised
- Soil handling operations will be avoided during periods of heavy rainfall.
- Bare surfaces will be left rough to encourage infiltration and minimise surface runoff.
- All soil stockpiles that are to in place for more than 3 months will be seeded.

6 CONTROL OF SOIL-BORNE AND ANIMAL DISEASES

Enquiries have been made to Animal Health and Veterinary Laboratories Agency and the Food and Environment Research Agency to confirm if:-

- 1 Any statutory restrictions apply to the site or in the immediate locality, and if any special precautions need to be taken.
- 2 They know of the presence of any soil-borne diseases in or near to the site.

The Animal and Plant Health Agency has confirmed (copy of correspondence included in previous Phase 2 and Phase 3 soil management plans) that it does not have any records of any burials within the Woodsmith Mine development area. The previous landowners have been contacted to ascertain if there are any recorded animal burials on site.

During the works, if animal burials are identified on site, they will be handled in accordance with current guidance (Ref. 6).

7 COMPLIANCE MONITORING

An Environmental Engineer will be appointed to oversee implementation of the Soil Management Plan during the Phase 4 Works who will undertake the following inspections prior to, during the soil handling works and on completion of the Phase 4 Works:-

- Prior to commencement of earthworks the Contractor's soils stripping plan shall be reviewed to confirm compliance with the objectives of the Soil Management Plan.
- Where a non-conformance is identified, this will be addressed by the Contractor prior to commencement of the earthworks. The Environmental Engineer will provide written confirmation to Sirius Minerals that the final agreed Soil's Stripping Plan complies with the Soil Management Plan prior to commencement of the earthworks.
- During the soil handling process, the Environmental Engineer will coordinate with the Contractor to undertake the soil characterisation and acceptability testing in accordance with Section 4.3 of the Soil Management Plan. The results of this testing will be reviewed and reported to Sirius Minerals on a weekly basis by the Environmental Engineer. Where the soils are determined to be of unacceptably high moisture content, the Environmental Engineer will identify the restrictions to be placed on soils handling of these materials and any further testing necessary prior to soil stripping or placement.

- Inspection of soil stripping, storage and of topsoil and subsoil amelioration, placement and preparation will be undertaken by the Environmental Engineer at a regular interval during the soils handling process of not less than one visit per week. The frequency of such inspections are to be determined with consideration of the Contractor's soils handling programme. Where practices are observed that do not comply with the Soils Management Plan, remedial actions will be recommended by the Environmental Engineer and a record of their implementation and effectiveness recorded within subsequent inspection reports. The results of these visual inspections will be reported by the Environmental Engineer on a weekly basis to Sirius Minerals.

At the end of Phase 4 Works, a Completion Report will be compiled by the Environmental Engineer to confirm that a suitable soil quality has been achieved and that the soils are fit for the landscape scheme. This report will be provided to Sirius Minerals within one month of completion.

8 MITIGATION AND REMEDIATION

Remediation will not be necessary if the Soil Management Plan detail is adhered to.

Within one week of completion of the Phase 4 Works, the Environmental Engineer will undertake a visual inspection of completed areas and then thereafter at a minimum frequency of one visit every three months. The Environmental Engineer will provide Sirius Minerals with a report documenting the findings of the quarterly inspections. This report will include a record of features observed that are indicative of erosion and poor drainage, recommendations on remedial actions and a recommended timeframe for implementing such actions. A record of the timeframe and works undertaken by Sirius Minerals to implement these measures, the mitigation works undertaken and their effectiveness will be recorded by the Environmental Engineer in the subsequent quarterly inspection reports issued to Sirius Minerals.

If erosion or poor drainage develops on completed areas remedial actions, control structures, barriers or additional drainage will be installed to check the flow of runoff, and/or loosen compacted surfaces to encourage infiltration.

Where compacted subsoil layers are observed, they will be loosened/ripped using commercial subsoiling equipment (e.g. a winged tine).

M LAKEY
PRINCIPAL CONSULTANT

R IZATT-LOWRY
DIRECTOR

9 REFERENCES

- 1 Defra, 2009. Construction Code of Practice for the Sustainable Use of Soils on Construction Sites.
- 2 Defra, 2005. Guidance for Successful Reclamation of Mineral and Waste Sites.
- 3 MAFF, 2000. Good Practice Guide for Handling Soils.
- 4 Land Research Associates, 2014. Soil Resources and Agricultural Use and Quality of Land at Dove's Nest Farm, Sneatonthorpe.
- 5 MAFF, 1991. Preventing the Spread of Plant and Animal Diseases – A Practical Guide (PB0486).
- 6 Defra. Precautions to Prevent the Spread of Animal & Poultry Disease - Code of Practice for Civil Engineers, Surveyors & Contractors

APPENDIX 1

DRAWINGS






UGGLEBARNBY
MOOR SAC

SNEATON THORPE
BECK

LITTLE
BECK

SNEATON LOW
MOOR SAC

1km

NOTES / KEY
SITE OWNERSHIP BOUNDARY 
NYM SAC 
SURFACE WATER 

DRAWING TITLE
WOODSMITH MINE
LOCATION PLAN

PROJECT TITLE
THE NORTH YORKSHIRE
POLYHALITE PROJECT

CLIENT
SIRIUS MINERALS PLC

STATUS
FINAL

DRAWN BY
CB

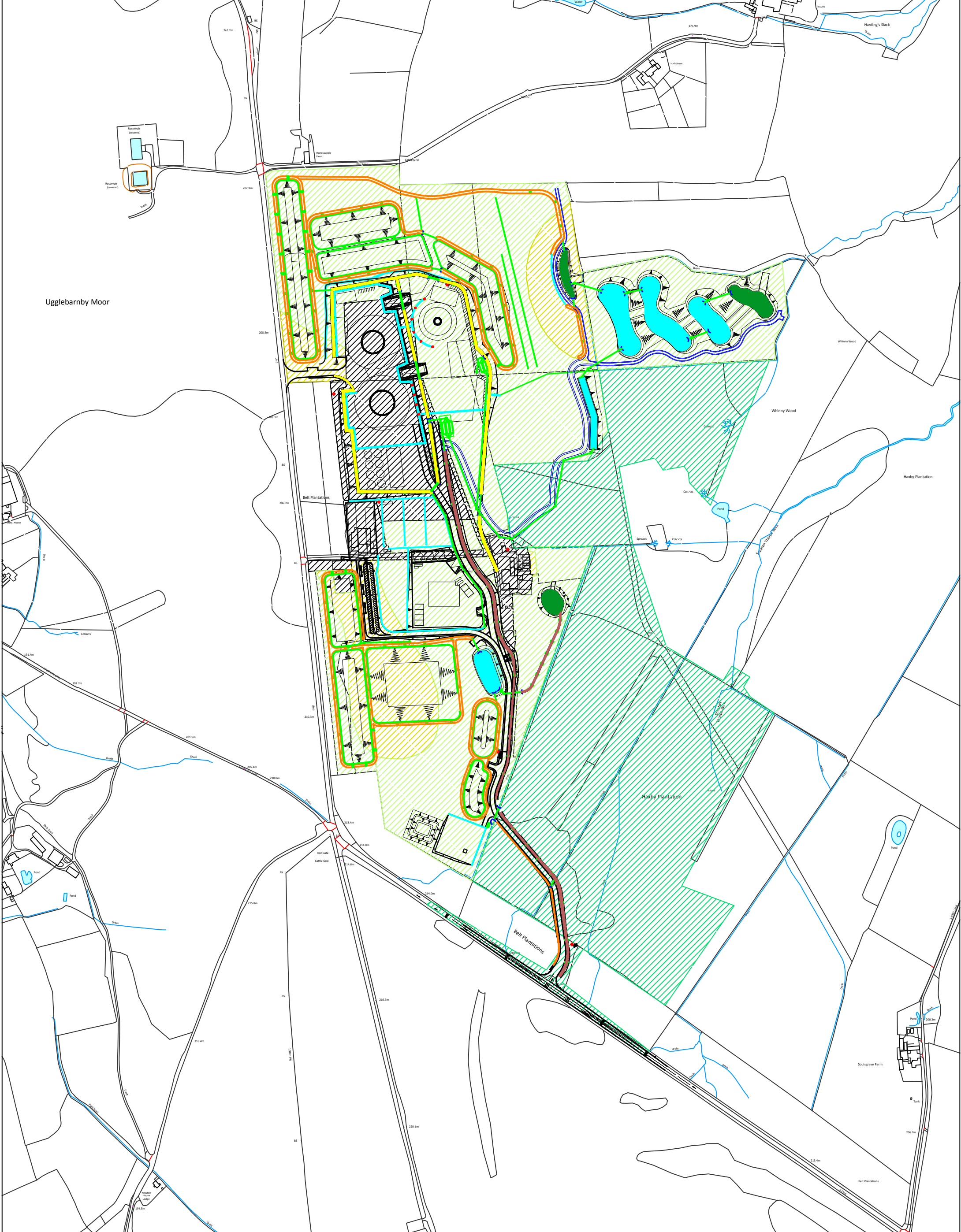
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PROJECT NUMBER
1433


DATE
March 2017


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NOTES / KEY

SITE OWNERSHIP BOUNDARY 

HARDSTANDING/TOPSOIL REMOVED 

TOPSOIL TYPES

- MEDIUM CLAY LOAM 
- HEAVY CLAY LOAM 
- WOODLAND SOILS 

Note Topsoil texture types extrapolated from Land Research Soil Resources Report

DRAWING TITLE

TOPSOIL TEXTURE TYPES AND
PHASE 4 WORKS

PROJECT TITLE

NORTH YORKSHIRE
POLYHALITE PROJECT

CLIENT

SIRIUS MINERALS PLC

STATUS

FINAL

DRAWN BY

CB

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1:5,000 @ A3

PROJECT NUMBER

1433

DATE

May 2017

DRG. No.

1433DevOD287

CLIENT

SIRIUS MINERALS PLC

STATUS

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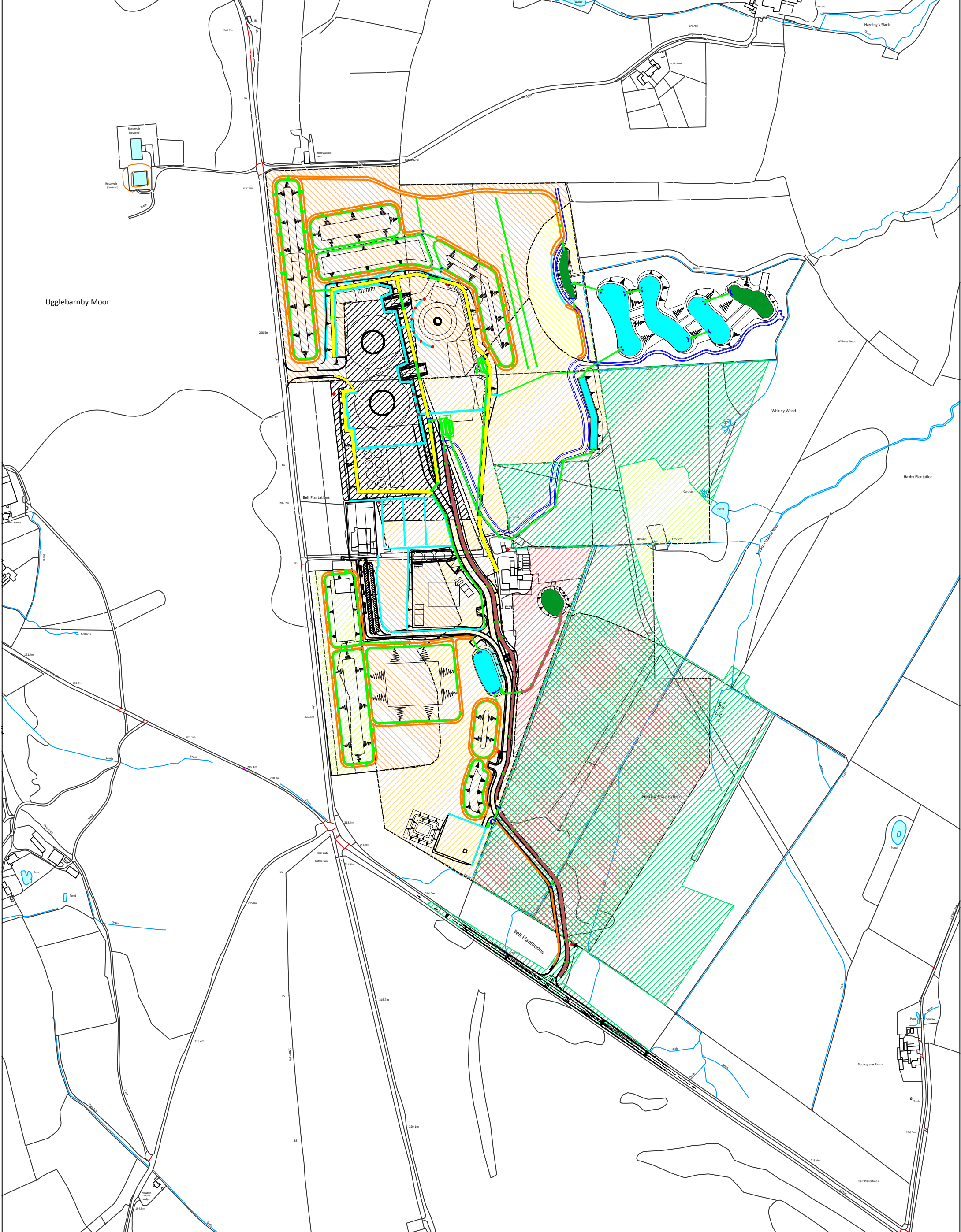
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SCALE


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Merrington House
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NOTES / KEY

SITE OWNERSHIP BOUNDARY 

HARDSTANDING/TOPSOIL REMOVED TOPSOIL THICKNESS

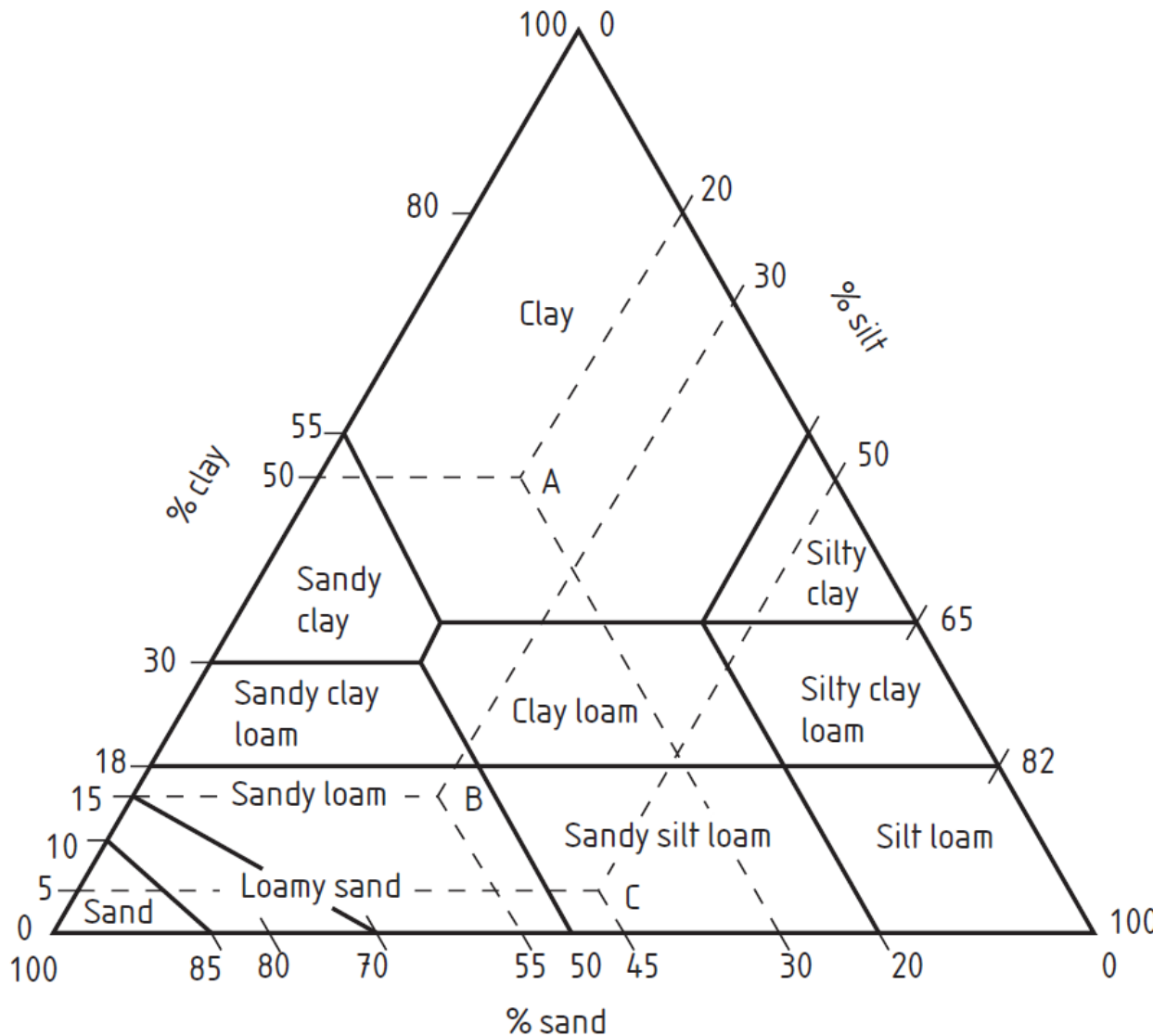
- 0 TO 0.15 M 
- 0.15 TO 0.20 M 
- 0.20 TO 0.25 M 
- 0.25 TO 0.35 M 
- 0.50 M+ 
- VARIABLE THICKNESS WOODLAND SOILS 

DRAWING TITLE
TOPSOIL THICKNESS AND PHASE 3 SITE PREPARATORY WORKS
PROJECT TITLE
NORTH YORKSHIRE POLYHALITE PROJECT

CLIENT	SIRIUS MINERALS PLC
STATUS	FINAL
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NOTE Examples of textural classification:

Soil A with 30% sand, 20% silt and 50% clay is in the “clay” textural class;

Soil B with 55% sand, 30% silt and 15% clay is in the “sandy loam” textural class;

Soil C with 45% sand, 50% silt and 5% clay is in the “sandy silt loam” textural class.

NOTES / KEY

CLIENT

SIRIUS MINERALS PLC

DRAWING TITLE

TOPSOIL TEXTURAL CLASSIFICATION –
BS 3882 : 2015

PROJECT TITLE

THE NORTH YORKSHIRE POLYHALITE PROJECT

STATUS

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CB

DATE

November 2016

SCALE

NOT TO SCALE

DRG. No.

1433DevOD214