KINGSTON SOLAR PROJECT, NR GOTHAM NOTTINGHAMSHIRE

Mining Risk Assessment

Prepared for: RES UK Ltd

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September 2021

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1.0 Introduction

SLR Consulting Limited (SLR) was commissioned by RES UK Limited (the "Client") to undertake a Mining Risk Assessment (CMRA) for the development of a potential 50MW Solar Energy Park, near Gotham, Nottinghamshire. The Site boundary is shown in red on Drawing 01.

This report has been prepared by the Land Quality Group of SLR Consulting Ltd based at Floor 2, 4/5 Lochside View, Edinburgh Park, Edinburgh, EH12 9DH. Tel: 44 (0)131-335-6830.

1.1 Site Location and Description

The Site is located at National Grid Reference (NGR) NT 453500, 328500 (centre) to the south of Gotham and west of East Leake and north of West Leake in Nottinghamshire. The proposed development area requires access via a private access road from the main Gotham Road. The Site has an approximate elevation ranging from 55m AOD in the northwest to 96m AOD in the southeast and comprises 3 separate parcels of land, Area 1, 2 and 3, comprising 44.4 ha, 24.7 ha and 20.2 ha, respectively.

The site will comprise solar panels over entire buildable site with access tracks, substation and equipment compound and distributed invertor stations, in a completely fenced area.

1.2 Objectives

This document, a Mining Risk Assessment (MRA), has been undertaken to address any potential historic mining activities that may impact the proposed development of the Site as a potential solar park at Kingston, Near Gotham, Nottinghamshire. The site will comprise arrays of solar panels with invertor stations and an electrical substation, with associated site tracks. Of these the invertor station and substations are the more sensitive parts of the project and will be considered as areas where location is essential to avoid any potential subsidence risk. The solar panels are less risk and can tolerate a level of subsidence. Site tracks could be considered low sensitivity as they can be more easily remediated and will probably need to pass through areas of medium risk.

The Site is located within in a mining area underlain by Triassic Age sedimentary rocks (where extensive underground mining of gypsum has been carried out) hence a mining risk assessment is required.

The assessment includes a combination of features as follows:

- Date of mining;
- Completion of mining;
- Extent of mining;
- Possible mine entries;
- Shallow workings (recorded and probable);
- Recorded mining related hazards;
- Subsidence issues; and

- Fissures, faults and breaklines.

In addition, consideration of the following:

- Provide indicative recommendations for any remedial or further detailed investigative works, as required.

The opportunity has also been taken to review publicly accessible data. In summary, the work comprised the following:

- A review of historical map records;
- Review of mine abandonment plans;
- A review of information held on British Geological Survey and British Gypsum;
- Collating information about site conditions and assessing the potential mining risks; and
- A Site walkover by an experienced mining geologist in April 2021.

To complete this MRA, geological information and maps were obtained from the British Geological Survey (BGS) 1:50,000 scale Ordnance Survey maps for Loughborough Sheet 141 were also reviewed, as well as a Technical Report WA/97/46 Geology of the West Leake Area[1].

Additional searches were requested from the British Gypsum, BGS and a review of aerial photographs and historical plans. To address the extent of mining undertaken at the Site and based on past mining activity, a review of mining abandonment plans was undertaken. To support the findings a review of available BGS boreholes and British Gypsum boreholes drilled into the underlying geology was also carried out to verify findings and in some instances confirm the location of the gypsum seam.

This report thus provides a review of the extent, age and type of mining activity (traditional underground mining) which has taken place on the Site.

The geological setting and mining framework of the Site and surrounding area are described in Section 2.0, which is followed by the Mining Assessment in Section 3.0, Mining Risk Assessment in Section 4.0 and Conclusions and Recommendations are presented in Section 5.0.

[1] *Technical Report WA/97/46 Geology of the West Leake Area*[1]. JN Carney and AH Coper British Geological Survey 1997.

2.0 Site Information

2.1 Mineral Rights and Ownership

British Gypsum is the trading name of Saint Gobain Construction Products United Kingdom Limited. British Gypsum is 100% owned by Saint Gobain SA. Saint Gobain, who are based in France and have operations in 64 countries and employ 190,000 people. Saint Gobain is the world's largest plaster and plasterboard manufacturer. Saint Gobain acquired British Gypsum in 2006.

Saint Gobain's main sectors of operation are Construction Products and Building Distribution, British Gypsum is the largest of Saint Gobain's Construction Products businesses in the UK. In the UK, the main building distribution brand is the Jewson chain of builders merchants.

Marblaegis Mining Company started in 1914 and later became part of British Plaster Board (BPB). In 1964 the company became known as British Gypsum and continues to trade as British Gypsum, but the parent company changed its name to Saint Gobain Construction Products UK Limited in 2015.

Mining activity underlying the Kingston Solar area was from several former mines including the Winsers Mine, closed in 1896, the Goodacres Mine abandoned in 1899, The Glebe Mine (closed in the early 1990's) and Kingston Mine which closed in 1940's. Glebe Mine lies to the west of Gotham Road in East Leake and extends underneath the West Leake Hills. It lies to the north of West Leake Road and the village of West Leake, with the western boundary following Dark Lane/West Leake Lane, whilst the eastern extent is formed by Gotham Road/Leake Road. The northern extent lies just south of the River Trent, though strictly speaking this area also includes Barton, Sheppards, Winsers, Goodacres, Weldon and Thrumpton mines. Glebe Mine has now closed following exhaustion of workable deposits by underground methods of extraction in the early 1990's.

The main entrance (referred to as a 'drift') to Marblaegis Mine which is still active to the east and south of the Site, together with the mine offices, are located to the north of the village of East Leake in the southern part of Nottinghamshire. The entrance is used for conveying crushed rock from the mine and for vehicles used by personnel accessing the mine. The second means of access/egress, known as the 'Silver Seal mine', is gained via an adit[11] at to the southeast of Bunny village adjacent to the A60. This is utilised for transporting large equipment, materials, for exhaust ventilation for the mine and escape/rescue purposes.

2.2 Site Setting

The proposed development area is predominately overlain by agricultural land, primarily arable with some pasture. Fields form a mosaic pattern being of varying size (from small to large) and irregular in shape. In the main the fields are bounded by mature hedgerows. In addition, blocks of woodland are evident within the area. All the fields are currently arable and no tree plantations are on the proposed site.

Although the area was extensively mined there is no evidence on site or from historic plans of mining infrastructure on site, the mining infrastructure, mine shafts, drift mines and airshafts were all located off site close to the outcrop position of the seams.

All mining has ceased below the site and the area has been mined from before the 1900's to as late as 1985.

2.3 Geology

In the UK, naturally occurring economic deposits of gypsum are relatively rare, there are only five mines and one quarry in operation in the UK, one of these is Marblaegis Mine which is still active to the southeast of the site.

Two main seams of gypsum are present in the East Leake sequence. Mining is currently restricted at East Leake to the lower seam, the Tutbury gypsum seam; this seam is up to 2.5m thick and varies between 30m and 120m

below the surface. The upper seam: the Newark gypsum seam is more variable in thickness and was previously worked by opencast and underground mining methods at Cropwell Bishop, but not mined around the Site.

The East Leake evaporite deposits are Triassic in age. They formed in a period of arid (dessert like) conditions. The gypsum seams are found in the Mercia Mudstone Formation (which is a gypsiferous red mudstone with occasional siltstone and sandstone (these are known locally as 'skerry') bands.

With increased depths the gypsum deposits become anhydritic (i.e., the gypsum deposit has not been re-hydrated); anhydritic gypsum (referred to as Anhydrite) is still suitable for use in the manufacture of cement rock but are not suitable, without beneficiation (using dense media separation plant to remove the small percentages of heavier anhydrite from the gypsum seam) for use in mill rock for the manufacture of plaster or plasterboard.

The higher grade gypsum deposits were mined for cementrock and mill rock and are still mined for this in the existing mine to the east of the site.

The gypsum seams are rarely found at outcrop as they either dissolve away (due to the solubility of gypsum) or are concealed beneath a thick mantle of glacial drift deposits.

The structure of the Tutbury gypsum seam has been established by extensive geological investigations involving the drilling of over 150 exploratory surface boreholes. The geological structure is a plunging (east – southeast) syncline oriented north – northwest to east – southeast. Gradients are low ~1 in 50.

3.0 MINING ASSESSMENT - Site

3.1 Gypsum Mining

Gypsum is extracted using a technique known as room and pillar mining, whereby approximately 25% of the reserve is left in situ in rectangular 'pillars' that support the strata above the gypsum seam. The pillars are set out on a regular grid such that the workings take on the appearance of a lattice in plan form.

Gypsum has been extracted at Marblaegis Mine using both drill and blast techniques and electric face cutting methods. In 2006, electric face cutting equipment was introduced to the mine. The drill and blast technique was the method therefore used over the entire Kingston site as it was mined out pre-1990.

3.2 Mining Technique

Since the mid 1970's the geotechnical properties of the Tutbury gypsum seam have been subject to detailed studies. These studies have been carried out mainly by the Universities of Newcastle-upon-Tyne and Leeds in conjunction with British Gypsum Technical management personnel. From these studies rock strength characteristics have been derived to form the basis of the engineering designs for safe underground mine workings.

The mechanical strength of gypsum has been determined by laboratory scale tests conducted on cores of rock. The strength of a gypsum pillar in a mine is a function of these mechanical properties and the geometry of the pillar. The design is based on the anticipated mining height.

Similar tests have also been undertaken on saturated samples of gypsum to quantify the long term strength of the gypsum pillars when the mine is ultimately flooded.

To ensure both the short and long term safety and stability of the workings the pillars in the mine are designed to an internationally recognised factor of safety of around 3 (dry) and minimum of 1.6 (wet) i.e., 60% stronger than required to resist the weight of the overlying strata. These test results include factors that consider the variable nature of the gypsum samples.

In the past, collapse of some of the old mine workings has occurred, notably at Glebe Mine. These collapses relate to early areas of mining when the technology governing extraction rates and mine design was poorly understood. It is therefore considered that mining pre 1970 poses a higher risk of subsidence that post 1970's mining and is considered a factor in the risk assessment.

In the mine today, the room and pillar workings have roadways with a maximum width of 6.5m and a maximum mining height of 2.5m.

The pillar sizes increase with depth. In the machine mined area, between 0 – 100m depth: from 9m x 5m, giving an extraction rate of 74%; between 100 – 125m depth where the pillars are 12m x 5m in size and the extraction rate is 72% and 125m – 140m where the pillars are 13m x 5m and the extraction rate 71%.

In addition to this, when working close to residential properties, "property pillars" are left to ensure the long term stability of the properties. The size of the pillar is a function of the depth of the workings in that it is calculated on half the depth (e.g. where the mine workings are at 100m depth, the property protection pillar would be 50m from the residential property).

3.3 Subsidence Monitoring

The mine is designed (using pillar and room) to minimise (if not eliminate) subsidence (the movement of the surface). Notwithstanding this, existing conditions require the monitoring of ground levels along the A60 and Wysall Road. Survey results are provided to the Mineral Planning Authority (MPA) on an annual basis confirming the stability of these areas.

3.4 Mining Subsidence

Gypsum has been mined in the East Leake area for over a hundred years. Several collapses are known to have occurred during this time. However, some collapses are due to the natural dissolution of gypsum at sub outcrop beyond the mining area and are not associated with mining activity.

There has been no subsidence relating to the modern workings at Marblaegis Mine. The mine is geotechnically designed and regularly inspected. There has been some subsidence and deterioration associated with areas of early workings dating back to the 1940's and 50's, this subsidence has been restored.

Areas of the mine that show any signs of deterioration would be located, barriered off and surface owners notified. For any known areas where members of the public would be at risk from surface subsidence, the applicant would contact surface landowners and would arrange for the area to be fenced off and safety signs erected. The areas affected would be re-graded and restored if/when subsidence occurred. Infilling of subsidence hollows would be undertaken using appropriate materials having regard to waste management regulations.

The risk of subsidence from the post 1970's mine workings is very low. Inspections of the post 1970's mine workings generally show only minor degradation. In parts of Marblaegis Mine the pre-1970's mine workings may still represent a subsidence risk. In the event of subsidence, the appropriate restoration would be carried out.

Linked to subsidence is natural gypsum dissolution. Gypsum is a soluble rock; it is classified as an evaporite rock, as it was originally deposited by crystallisation from water. The result of gypsum dissolution is not dissimilar to limestone solution, with Karstic features forming including sinkholes.

There are several different types of sinkholes. Some result from the surface dissolution of the gypsum (solution sinkholes), for example limestone slowly dissolves when attacked by rainfall or groundwater that is acidic.

Sinkholes also occur where a thin covering of loose superficial material such as sand, clay or soil covers the soluble rocks beneath. In this setting, the soil can be washed into solutionally widened fissures below, leading to the development of a cavity within the overlying material

If the cover material is sandy, it will tend to gradually slump into the fissures, slowly creating a sinkhole over time. However, if the material is more cohesive, like clay, then the cavity can grow quite large before collapsing; a process termed a 'drop out' sinkhole or crown hole.

Several things can trigger sinkholes. The simple process of gradual dissolution can cause a sinkhole to form at the surface. However, other factors, including humans can induce sinkholes to form, such as: heavy rain or surface flooding can initiate the collapse of cavities, within superficial deposits. Leaking pipes, burst water mains and irrigation are all documented examples of things that trigger sinkholes. Changes in water table level such as drought or groundwater abstraction can cause sinkholes by changing the level of the water-table. This removes the buoyant support water provides to a cavity. Draining these cavities can cause them to collapse; no such collapses would be expected more than 60 years after mining commenced.

Mining can be a factor in causing sinkholes, either by dewatering and lowering of the water-table or by intercepting clay filled voids which subsequently collapse. No clay filled voids have been intersected at Marblaegis Mine.

Near Marblaegis Mine, there is some evidence of gypsum dissolution linked to natural dissolution of gypsum which outcrop beneath the glacial drift.

Prior to restoration of mining related subsidence features, the company assesses the planning and waste permitting requirements. The aim of restoration works is to reinstate the land to its former use and utility. Where the surface is not controlled by British Gypsum, negotiations are undertaken with the respective surface landowner to identify the best method for addressing the subsidence; identifying suitable fill materials; surface

treatment as appropriate to the original land use; prior to restoration commencing the company assesses whether the subsidence is stable and that restoration can commence, this is done using observations, previous experience and surveying, as necessary.

If it is necessary to infill agricultural land which has subsided because of mining operations or dissolution of gypsum, this will be done using the appropriate materials which would normally be permitted development.

As noted above, the existing planning conditions require surveying of the level of several roads in the area to confirm that no subsidence is occurring. Results are submitted to the MPA annually.

4.0 Mining Risk Assessment

For the purposes of this mining risk assessment all sources (abandonment plans, reports, available borehole records etc) have been assessed and assigned a relative degree of risk to highlight potential areas of concern based on identified features and potential future actions.

Each area has been addressed individually and a risk plan developed highlighting any significant issues at each location based on the parameters outlined below and included in summary in Table 4-1 and in detail in Appendix A. Each area has been split into individual plots for ease of reference, Area 1 is split into 12 blocks, Area 2 into 5 blocks and area 3 into 2 blocks (Drawing 2).

- Geology
- Depth to bedrock
- Historic Mine Workings
- Depth to Workings
- Mining Void
- Void to Mining Ratio
- Type of Workings
- Evidence of Subsidence
- Mining Risk to Solar Farm
- Mining Risk to infrastructure

Evidence from mining suggests there are three potential types of subsidence effects that may impact the area. These are:

1. Long term subsidence over a wide area
2. Localised surface dissolution of the gypsum
3. Sink holes or crown holes migrating from the workings to surface

4.1 Long Term Subsidence

Of these long term subsidence has been monitored by British Gypsum and there is no significant subsidence, with only very minor movement identified in long term monitoring from 2007 to 2014 along the A60 Loughborough Road undertaken by British Gypsum as part of their planning commitment. Based on the age of the workings underlying the site, it is considered that this presents a negligible to low risk to the proposed development and is the most predictable element of risk. Where the workings are post 1970 the risk is considered negligible and pre-1970, the risk is considered low.

4.2 Localised Issues (Surface Dissolution and Sink Holes)

There is however evidence of subsidence issues which appear to be related to older workings, based on evidence of localised settlement issues. Evidence from British Gypsum has indicated that several localised areas of subsidence have presented themselves which have been remediated intermittently in the fields. There was no evidence of these being significant sink holes, rather localised subsidence issues which occur intermittently related to high rain fall. As none of these have presented themselves as anything more than localised depressions it is not anticipated that these are sink holes migrating from the workings to surface but as localised subsidence issues because of mining collapse and localised minor subsidence. These are the least predictable, based on historic occurrences and the random nature of the occurrence.

What is known from long term mining history is that most of the settlement issues are recorded over older workings and are localised settlement areas ranging from a few metres diameter to up to 90metres. These are

unpredictable, however the risk to the project is low as it is very localised. The impact to the site has been very minor, and the likelihood is that minor settlement of solar panels could be managed through minor adjustment and relevelling of the solar panels should subsidence occur. Should localised subsidence occur it would impact on a limited scale to the project and would not have a major financial or strategic impact. It would be recommended that any of the sensitive infrastructure items (i.e., the invertors and substation) should be located away from these areas.

Areas of localised subsidence in Areas 1/7 and 1/10 in 2001

Areas of localised subsidence in Areas 1/8,9 and 1/10 2013

Other issues such as slope, ground conditions will also influence the development potential, however these are civil engineering related than directly to mining. Slope does influence areas such as 1/6 and 1/7 reducing the effective rock cover from surface to mining level (Drawing 3).

4.3 Risk Assessment

Table 4-1 presents the framework used to complete the assessment. Where most of the site falls into one category then the assessment categorises the risk based on that Risk Status, if localised areas of higher risk are identified within the area they are identified in the text. The definition as it relates to the past mining below the site is indicated in Table 4-1.

TABLE 4-1 RISK ASSESSMENT FRAMEWORK

Risk Status	Action
No Risk	No feature(s) considered to pose any risk to proposed development. No further action required. At Kingston this is defined where there is no mining activity below the site.
Negligible Risk	Identified feature(s) not considered to pose any risk to proposed development. No further action required. At Kingston this is defined where there is mining activity below the site, with depths more than 60m and engineered mining

Risk Status	Action
	pillars (post 1970).
Low Risk	Identified feature(s) are unlikely to pose a risk to any future proposed development and further action may be required such as intrusive site investigation works. At Kingston this is defined where there is mining activity below the site, with depths more than 50-60m and engineered mining pillars (pre-1970).
Medium Risk	Identified feature(s) may present a risk to any future proposed development and further actions are likely to be required including but not limited to intrusive site investigation works and potentially ground improvement works. At Kingston this is defined where there is mining activity below the site, with depths between 40 to 50m and/or evidence of surface subsidence features.
High Risk	Identified feature(s) present a risk to any future proposed development and further actions are required including but not limited to intrusive site investigation works and potentially ground improvement works. At Kingston this is defined where there is mining activity below the site, with depths between less than 40m and/or evidence of surface subsidence features.

The following Table 4-2 summarises the key influencing factor in each area derived from the detailed Risk Assessment included in Appendix A and Drawing 6.

TABLE 4-2 RISK ASSESSMENT FRAMEWORK FOR EACH AREA

Area	Main Influencing Factor	Risk Assessment
1/1	Post 1970 workings with over 50m of cover	NEGLIGIBLE
1/2	Post 1970 workings with over 60m of cover dropping to 40m	NEGLIGIBLE TO LOW
1/3	Post 1970 workings with over 60m of cover	NEGLIGIBLE
1/4	Localised Pre 1900 workings with over 60m of cover in north of site, most of site No Risk to Negligible Risk	NO RISK TO NEGLIGIBLE
1/5	Post 1970 workings with over 50m of cover	NEGLIGIBLE
1/6	Post 1970 workings with over 50m of cover	NEGLIGIBLE
1/7	Localised subsidence associated over older workings 1900-1940 workings with over 60m of cover dropping to <40m	LOW with isolated MEDIUM
1/8	Localised subsidence associated over older workings 1900-1940 workings with over 60m of cover	LOW with isolated MEDIUM
1/9	Localised subsidence associated over older workings 1900-1940 workings with over 60m of cover	LOW with isolated MEDIUM
1/10	Localised subsidence associated over older workings 1900-1940 workings with over	NO RISK to LOW with

	60m of cover	isolated MEDIUM
1/11	Post 1970 workings with over 60m of cover. Localised subsidence associated over older workings 1900-1940 workings however still over 60m of cover	NO RISK to LOW with isolated MEDIUM
1/12	Post 1970 workings with over 60m of cover	NO RISK to LOW with isolated MEDIUM
2/1	1980-85 workings with over 60m of cover	NO RISK TO NEGLIGIBLE TO LOW
2/2	1980-85 workings with over 60m of cover	NEGLIGIBLE
2/3	1980-85 workings with over 60m of cover	NEGLIGIBLE
2/4	1980-85 workings with over 60m of cover	LOW with isolated MEDIUM
2/5	1980-85 workings with over 60m of cover, older workings 1940-1960 to north east	NEGLIGIBLE TO LOW
3/1	1975-80 workings with over 60m of cover	NO RISK TO NEGLIGIBLE
3/2	1940-60 workings with over 60m of cover	NO RISK TO NEGLIGIBLE TO LOW

4.4 Mining Records

The review of historical mapping and extensive previous investigations and assessments has indicated that the Site and surrounding area has been subjected to historical mining (underground gypsum mining).

Review of the available data indicates that the Site is located over a mined out area. The data indicates the following at the Site;

- Past shallow workings are present below the Site on one seam of gypsum.
- The underground mineworking date ages within and adjacent to the area of the Site indicate that they range from 1890 to 1985.
- There have been subsidence issues associated with older workings and generally shallower depths than encountered on site.
- Outcropping gypsum is not present beneath the Site.
- There are no mine entries on the Site.

4.5 Mining Abandonment Plans

Abandonment plans were available from British Gypsum, which we have based our findings on, including the use of the underground mining plans, geological plans, the BGS Web Site and our current knowledge of the local area.

4.6 Mine Entries

There are no known mine entries within or close to the Site boundary.

5.0 SUMMARY AND RECOMMENDATIONS

The mining assessment has established that the area within the Site boundary has been subject to past underground mining. The Site has localised areas of medium risk, as indicated as localised subsidence highlighted in Drawing 4, 5 and 6.

Drawing 4 illustrates the depth of cover to workings in relation to the site.

Drawing 5 the Preliminary Risk Plan was generated by RES and was used as a base line for the assessment prior to detailed assessment on site. It has been included as it clearly indicates the depth of workings to the proposed site location.

Drawing 6 shows the Detailed Risk Areas overlying the mine workings, in relation to the site.

The Site is underlain by the Tutbury gypsum seam and has been subject to underground mining.

Based on review of borehole records it has been confirmed that there has been gypsum mined below the Site at depths between 40m to over 60m.

Underground mining is known to have taken place between the late 1800's up until 1985. Older workings pre 1970 are more prone to subsidence issues and where the rock cover is minimal crown holes developing. The site is protected by rock cover generally more than 50m so the potential for catastrophic failure is **Low Risk.** Where the mining is post 1970, with larger well defined and regular pillar structures the risk of subsidence is significantly less and hence these areas are classed as **Negligible Risk**.

Boreholes and geological and mining plans reviewed from the BGS and Coal Authority website, provide evidence that these is one seam mined (Tutbury) underlying the entire Site. There is no potential for unrecorded workings on the seams to exist below the Site.

The proposed development location is situated in an area where there are a few identified constraints, based on the age of workings ranging from **Negligible to Low** Risk.

The potential for unrecorded workings is considered to pose **No Risk**.

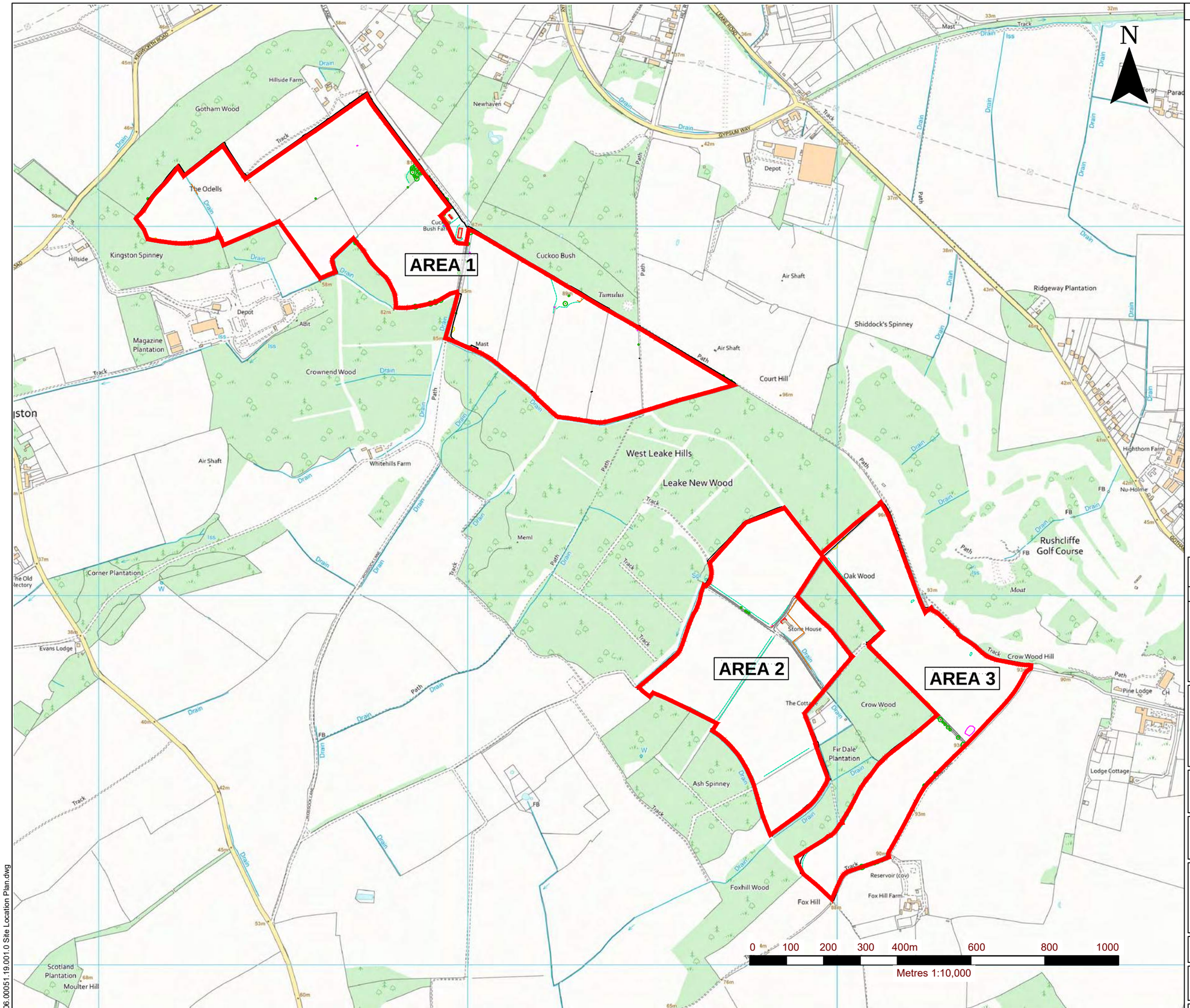
The presence of shafts and adits are considered a **Low Risk.**

Overall, the Site development should be considered ranging from **Negligible to Low** predominantly, with very localised areas of **Medium Risk** from localised subsidence events which are very rare and very difficult to predict.

The development as a solar farm is unlikely to be impacted severely by past historic mining, the infrastructure can be located on **Negligible to Low** Risk Areas and any potential subsidence can be mitigated through flexible design and adjustable fixtures to allow for minor subsidence.

DRAWINGS

Drawing 01: Site Location



LEGEND

SITE BOUNDARY

Revision	By	Chk'd By	Date	Comments
0	IG	CD	04/21	

SLR
4/5 LOCHSIDE VIEW
EDINBURGH PARK
EDINBURGH
EH12 9DH

T: +44 (0)131 335 6830
www.slrconsulting.com

Site
KINGSTON SOLARFARM

Project

Drawing Title
SITE LOCATION PLAN

Scale
1:10,000 @ A3

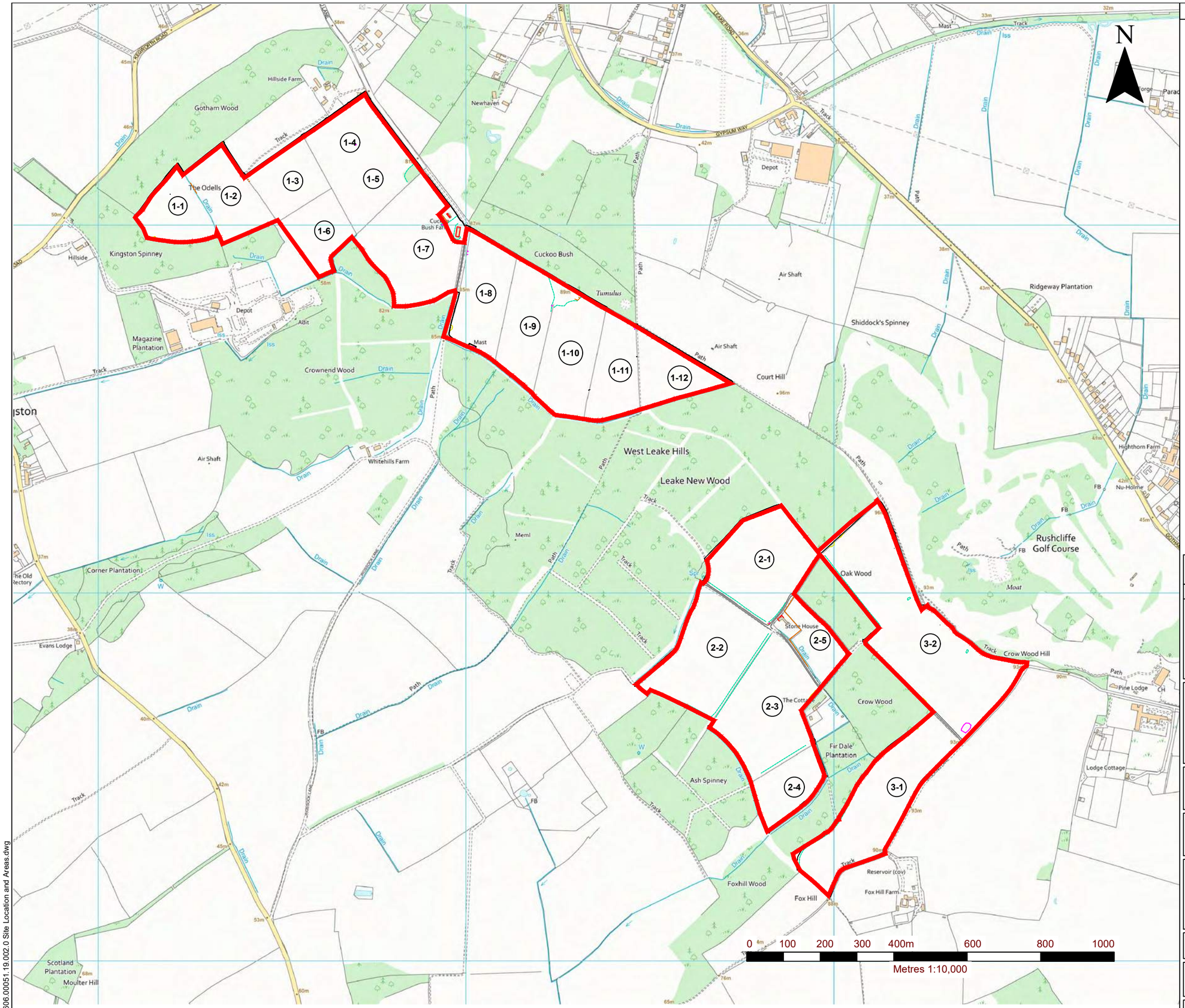
Date
APRIL 2021

Drawing Number
001

Revision
0

02606.00051.19.001.0 Site Location Plan.dwg

Drawing 02: Site Location and Site Areas



LEGEND

SITE BOUNDARY

1-7 AREA LOCATION AND NUMBER

Revision	By	Chk'd By	Date	Comments
0	IG	CD	04/21	

SLR

4/5 LOCHSIDE VIEW
EDINBURGH PARK
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EH12 9DH

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www.slrconsulting.com

Site
KINGSTON SOLARFARM

Project

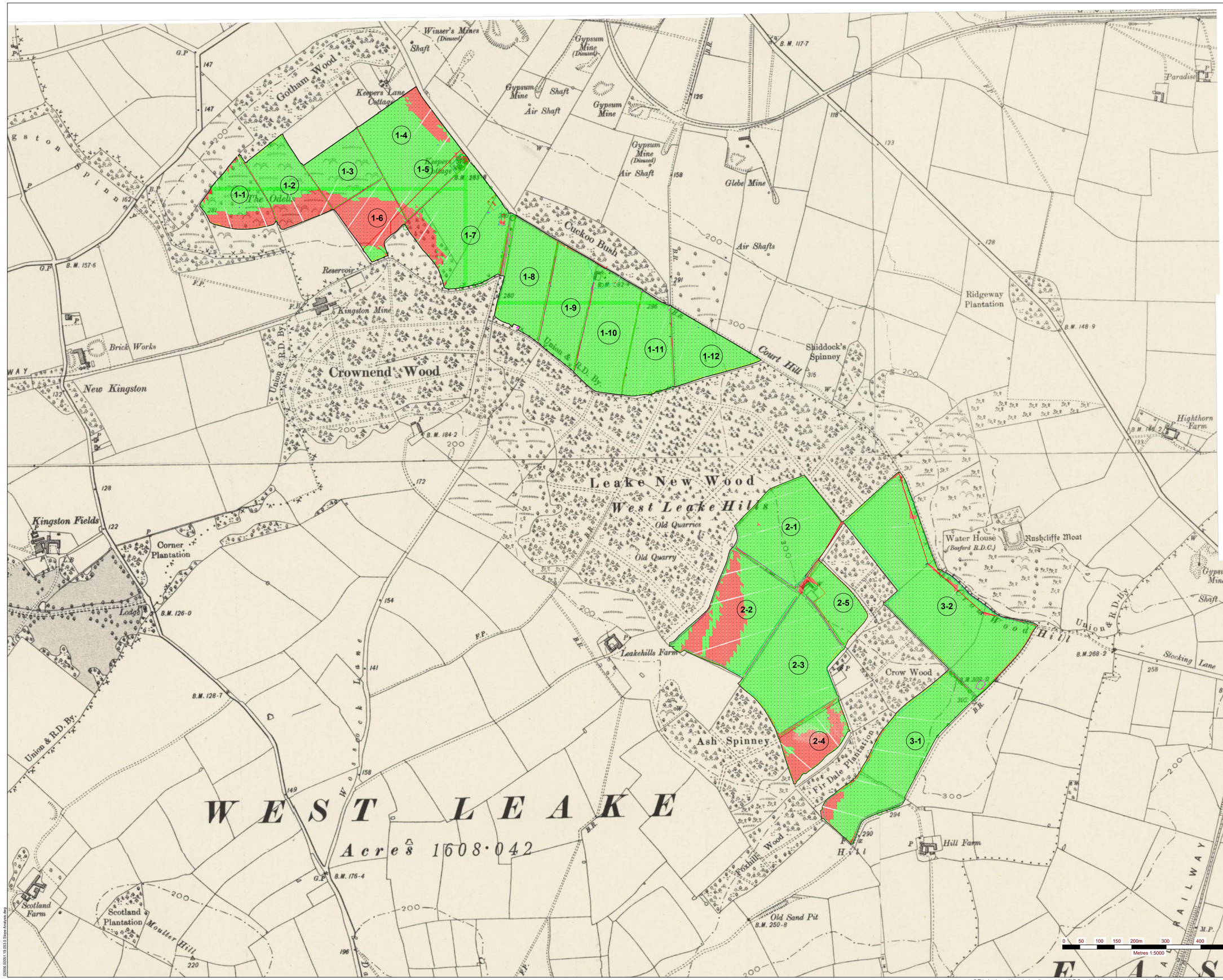
Drawing Title
SITE LOCATION AND AREAS

Scale	Date
1:10,000 @ A3	APRIL 2021

Drawing Number	Revision
002	0

02606.00051.19.002.0 Site Location and Areas.dwg

Drawing 03: Slope Plan with Historical Mining



NOTES

LEGEND

SLOPE LESS THAN 10.00%

SLOPE MORE THAN 10.00%

Revision	By	Chk'd By	Date	Comments
0	IG	CD	04/21	

SLR

4/5 LOCHSIDE VIEW
EDINBURGH PARK
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Site: KINGSTON SOLAR

Project:

Drawing Title: **SLOPE PLAN WITH HISTORICAL MINING**

Scale: 1:5000 @ A1

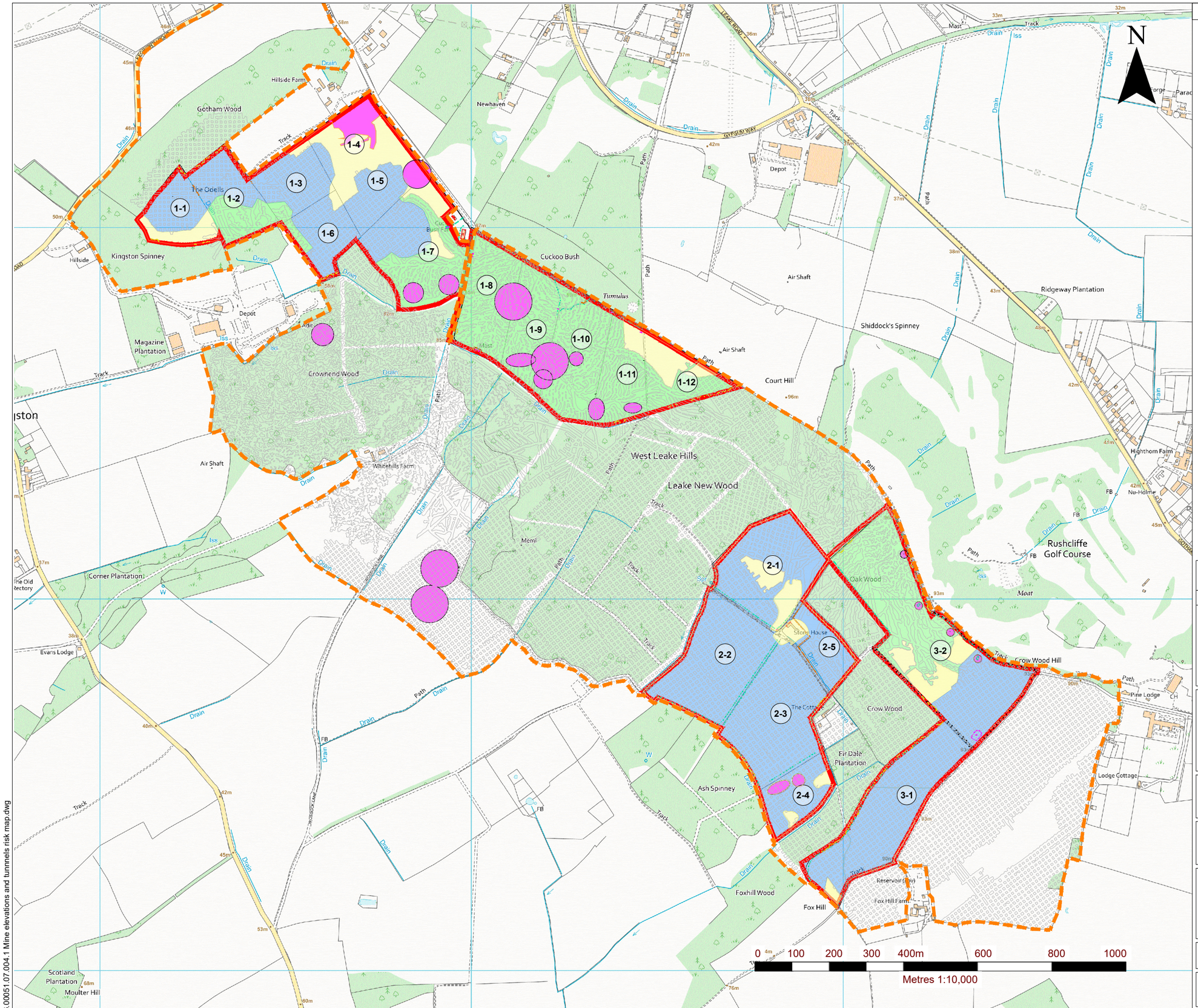
Date: APRIL 2021

Drawing Number: 003

Revision: 0

0260600031-R003.02 Slope Analysis.dwg

Drawing 04: Mine Elevation



LEGEND

- SITE BOUNDARY
- EXTENT OF LAND OWNERSHIP
- 1-7 AREA LOCATION AND NUMBER
- NO RISK
- NEGLIGIBLE RISK
- LOW RISK
- MEDIUM RISK

Revision	By	Chk'd By	Date	Comments
0	IG	CD	01/22	

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Site
KINGSTON SOLAR

Project

Drawing Title
MINE ELEVATION ESTIMATE AND COVER TO MINE TUNNELS RISK MAP

Scale	Date
1:10,000 @ A3	JANUARY 2022

Drawing Number	Revision
004	0

02606.00051.07.004.1 Mine elevations and tunnels risk map.dwg

Drawing 05: Preliminary Risk Plan

KEY:

- **DEVELOPMENT BOUNDARY**
- **EXTENT OF LANDOWNERSHIP**
- **VERY LOW RISK:** FINAL RISK SCORE OF 1
- **LOW RISK:** FINAL RISK SCORE OF BETWEEN 2-5
- **MEDIUM RISK:** FINAL RISK SCORE OF BETWEEN 6-9
- **HIGH RISK:** FINAL RISK SCORE OF BETWEEN 10-14
- **VERY HIGH RISK:** FINAL RISK SCORE OF 15 OR MORE
- **NO ELEVATION DATA:** FINAL RISK SCORE CANNOT BE CALCULATED
- **SUBSIDENCE EVENT OR CROWN HOLE:** AS DEFINED BY BRITISH GYPSUM
- **POTENTIAL SUBSIDENCE EVENT:** PICKED UP FROM AERIAL IMAGE SCREENING AND SITE VISITS

NOTES:

1. FINAL RISK SCORES ARE THE PRODUCT OF THREE INDIVIDUAL RISK SCORES PERTAINING TO MINE DEPTH, MINE WORKING PERIOD, AND PROXIMITY TO EXISTING GROUND MOVEMENT. EACH INDIVIDUAL RISK SCORE RANGES FROM 1-5.
2. A FULL METHODOLOGY FOR THE CALCULATION OF FINAL RISK SCORES IS OUTLINED IN DOCUMENT 04533-2279870.
3. DEVELOPMENT BOUNDARY AS PER OPTION SITE BOUNDARY IN DRAWING 03009-RES-PRO-DR-LE-001.
4. MINING WORKS EXTENT AND WORKING PERIOD ZONES DEFINED AS PER WORKING PERIOD HATCHES IN BRITISH GYPSUM PLAN 'GLEBE MINE MINING PERIODS DATE PLAN' DATED 18.02.21.
5. LAND OUTSIDE OF MINE WORKINGS EXTENT IS CONSIDERED NOT TO CARRY ANY RISK PERTAINING TO THE MINING WORKS.
6. MINE DEPTH ESTIMATED USING BOREHOLE DATA PROVIDED BY BRITISH GYPSUM AND GROUND ELEVATION DATA FROM GOOGLE EARTH.
7. MINE WORKING EXTENTS HAVE BEEN EXTENDED TO COVER 2NO SMALL AREAS OF LAND OVERLYING UNWORKED GROUND THAT ARE SURROUNDED BY MINE WORKINGS.

ISSUE	DRAWN	CHKD	APPD	DATE	REVISION NOTES
2	JL	BY APPD	VM	2022-01-20	MAPPING EXTENT ADJUSTED
1	JL	BY APPD	VM	2021-03-25	First Issue

PURPOSE: FOR DESIGN	COORDINATES: OSGB
SCALE: 1:5,000 @ A1	LEVEL DATUM: N/A
LAYOUT DWG: N/A	T-LAYOUT NO.: N/A

PROJECT TITLE: KINGSTON

DRAWING TITLE: GYPSUM MINE PRELIMINARY RISK MAP

RES DRAWING NUMBER: 005 | REV: 2

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Drawing 06: Site Location and Risk Areas

GE:53.64m
MD:26.90m
ME:26.74m
ABD 1896
GE:52.33m
MD:21.30m
ME:31.03m
GE:86.50m
MD:60.60m
ME:25.90m
GE:86.34m
MD:63.80m
ME:22.54m
GE:85.70m
MD:63.30m
ME:22.40m
1985-90
GE:85.30m
MD:60.50m
ME:24.80m
GE:84.60m
MD:59.80m
ME:24.80m
GE:88.45m
MD:61.70m
ME:26.75m
GE:77.20m
MD:56.50m
ME:20.70m
PRE-1940
1980-85
1960-65
1965-70
1975-80
1940-60
1970-75
GE:90.20m
MD:66.00m
ME:24.20m
GE:81.55m
MD:78.00m
ME:03.55m
Newhaven
Cuckoo Bush
Tumulus
Kingston Spinney
Hillside
Depot
Magazine Plantation
Crownend Wood
Air Shaft
Whitehills Farm
Corner Plantation
Evans Lodge
Scotland Plantation
Moulter Hill
West Leake Hills
Leake New Wood
Court Hill
Shiddock's Spinney
Ridgeway Plantation
Paradise Forge
Paradise
Highthorn Farm
Nu-Holme
Rushcliffe Golf Course
Oak Wood
Moat
Crow Wood Hill
Pine Lodge
Lodge Cottage
Fir Dale Plantation
Ash Spinney
Foxhill Wood
Fox Hill
Fox Hill Farm
Reservoir (Gov)
Stone House
Gypsum Quarry
GYPSUM WAY
LEAKE ROAD
WOODCOCK LANE
GOTHAM ROAD

GE (Ground Elevation) : Elevation above sea level at borehole location as per Google Earth.

MD (Mine Depth) : Depth at which mine tunnel reached in borehole log data provided by British Gypsum.

ME (Mine Elevation) : Elevation of mine tunnel assumed by subtracting mine depth from ground elevation at each borehole location.

AREA 1

Mean Average Mine Elevation: 22.07m
Worst Case Mine Elevation: 31.03m
Worst Case ME inside Area 1: 24.96m

AREA 2/3

Mean Average Mine Elevation: 22.51m
Worst Case Mine Elevation: 41.93m
Worst Case ME inside Area 3: 24.60m

0 50 100 150 200m 300 400 500
Metres 1:5000

N

NOTES

1. FINAL RISK SCORES ARE THE PRODUCT OF THREE INDIVIDUAL RISK SCORES PERTAINING TO MINE DEPTH, MINE WORKING PERIOD, AND PROXIMITY TO EXISTING GROUND MOVEMENT. EACH INDIVIDUAL RISK SCORE RANGES FROM 1-5.

2. A FULL METHODOLOGY FOR THE CALCULATION OF FINAL RISK SCORES IS OUTLINED IN DOCUMENT 04533-2279870.

3. DEVELOPMENT BOUNDARY AS PER OPTION SITE BOUNDARY IN DRAWING 03009-RES-PRO-DR-LE-001.

4. MINING WORKS EXTENT AND WORKING PERIOD ZONES DEFINED AS PER WORKING PERIOD HATCHES IN BRITISH GYPSUM PLAN 'GLEBE MINE MINING PERIODS DATE PLAN' DATED 18.02.21.

5. LAND OUTSIDE OF MINE WORKINGS EXTENT IS CONSIDERED NOT TO CARRY ANY RISK PERTAINING TO THE MINING WORKS.

6. MINE DEPTH ESTIMATED USING BOREHOLE DATA PROVIDED BY BRITISH GYPSUM AND GROUND ELEVATION DATA FROM GOOGLE EARTH.

7. MINE WORKING EXTENTS HAVE BEEN EXTENDED TO COVER 2NO SMALL AREAS OF LAND OVERLYING UNWORKED GROUND THAT ARE SURROUNDED BY MINE WORKINGS.

8. MAPPING EXTENT ADJUSTED AS PER RES DRAWING 04533-RES-IMP-DR-PE-001, DATED 20TH JANUARY 2022.

LEGEND

DEVELOPMENT BOUNDARY

EXTENT OF LAND OWNERSHIP

COVER TO MINE TUNNELS RISK

RISK SCORE = 1 (VERY LOW): MORE THAN 60m COVER TO MINE TUNNELS

RISK SCORE = 2 (LOW): BETWEEN 50m-60m COVER TO MINE TUNNELS

RISK SCORE = 3 (MEDIUM): BETWEEN 40m-50m COVER TO MINE TUNNELS

RISK SCORE = 4 (HIGH): BETWEEN 30m-40m COVER TO MINE TUNNELS

RISK SCORE = 5 (VERY HIGH): LESS THAN 30m COVER TO MINE TUNNELS

Revision	By	Chk'd By	Date	Comments
0	IG	CD	01/22	

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Site: KINGSTON SOLAR

Project:

Drawing Title: **SITE LOCATION AND RISK AREAS**

Scale: 1:5000 @ A1

Date: JANUARY 2022

Drawing Number: 006

Revision: 0

APPENDICES

Risk Assessment for each Area

Site Location	Area 1/1
Current Use	Agriculture - arable
Slope	Mainly flat lying with steeper slope (>10%) to south over 25% of site
Soil type	Slightly clayey soils
Geology	Triassic calcareous mudstones of the Barnstone Member, overlying the Cotham Member, the Westbury Formation and the Blue Anchor Formation (gypsum)
Depth to bedrock	2m
Existing constraints	Avoid >10% slope to the south
Services	None
Evidence of Historic Mine Workings	Kingston Mine entrance to south
Depth to workings	>50m
Age of workings	1985-90, limited older workings in extreme southeastern corner
Mining Void	2.5 m maximum
Void to Rock Ratio	>10:1
Type of Workings	Pillar and Room regular design
Evidence of subsidence	None evident, slight erosion on south facing slope, not necessarily mining related
Mining Risk to Solar Farm	Negligible
Mining Risk to Infrastructure	Negligible
Is site suitable for solar panels	Yes, on flatter area to the north
Is site suitable for infrastructure	Yes, on flatter area to the north
OVERALL MINING RISK	**NEGLIGIBLE**

Area 1/1 looking Southwest

Site Location	Area 1 /2
Current Use	Agriculture - arable
Slope	Mainly flat lying with steeper slope (>10%) to south over 33% of site
Soil type	Slightly clayey soils
Geology	Triassic calcareous mudstones of the Barnstone Member, overlying the Cotham Member, the Westbury Formation and the Blue Anchor Formation (gypsum)
Depth to bedrock	2m
Existing constraints	Avoid >10% slope to the south
Services	None
Evidence of Historic Mine Workings	Kingston Mine entrance to south
Depth to workings	60m dropping to around 40m to south of site
Age of workings	1985-90, older workings in south of site 1900-1940
Mining Void	2.5 m maximum
Void to Rock Ratio	>10:1
Type of Workings	Pillar and Room regular design except for small area of older workings
Evidence of subsidence	None evident
Mining Risk to Solar Farm	Low
Mining Risk to Infrastructure	Low
Is site suitable for solar panels	Yes, on flatter area to the north
Is site suitable for infrastructure	Yes, on flatter area to the north
OVERALL MINING RISK	**NEGLIGIBLE TO LOW**

Area 1/2 looking West

Site Location	Area 1/3
Current Use	Agriculture - arable
Slope	Mainly flat lying with steeper slope (>10%) to south over 10% of site
Soil type	Slightly clayey soils
Geology	Triassic calcareous mudstones of the Barnstone Member, overlying the Cotham Member, the Westbury Formation and the Blue Anchor Formation (gypsum)
Depth to bedrock	2-3m
Existing constraints	Avoid >10% slope to the southwest corner
Services	
Evidence of Historic Mine Workings	Kingston Mine entrance to south
Depth to workings	>60m
Age of workings	1985-90, limited older workings in extreme southwest of site
Mining Void	2.5 m maximum
Void to Rock Ratio	>10:1
Type of Workings	Pillar and Room regular design except for very small area of older workings
Evidence of subsidence	None evident
Mining Risk to Solar Farm	Negligible
Mining Risk to Infrastructure	Negligible
Is site suitable for solar panels	Yes, on flatter area to the north
Is site suitable for infrastructure	Yes, on flatter area to the north
OVERALL MINING RISK	**NEGLIGIBLE**

Area 1/3 looking Northeast

Site Location	Area 1/4
Current Use	Agriculture - arable
Slope	Mainly flat lying over entire site, steeper slope (>10%) to north (15%)
Soil type	Slightly clayey soils
Geology	Triassic calcareous mudstones of the Barnstone Member, overlying the Cotham Member, the Westbury Formation and the Blue Anchor Formation (gypsum)
Depth to bedrock	2-3m
Existing constraints	Older abandoned workings to the north, particularly on Block 4, northern half
Services	
Evidence of Historic Mine Workings	Winsers Mine abandoned to north in 1896
Depth to workings	60-65m
Age of workings	1985-90, limited older workings in extreme in northeast of site (1896) from Winsers Mine and small area of workings in 1985-90 in west
Mining Void	2.5 m maximum
Void to Rock Ratio	>10:1
Type of Workings	Pillar and Room regular design for younger workings, irregular anticipated for older workings
Evidence of subsidence	None evident, slight subsidence at northwestern corner, poor drainage?
Mining Risk to Solar Farm	No Risk to Negligible
Mining Risk to Infrastructure	No Risk to Negligible
Is site suitable for solar panels	Yes, on flatter area to the north
Is site suitable for infrastructure	Yes, on flatter area to the north
OVERALL MINING RISK	**NO RISK TO NEGLIGIBLE**

Area1/4 Looking North

Site Location	Area 1/5
Current Use	Agriculture - arable
Slope	Mainly flat lying over entire site
Soil type	Slightly clayey soils
Geology	Triassic calcareous mudstones of the Barnstone Member, overlying the Cotham Member, the Westbury Formation and the Blue Anchor Formation (gypsum)
Depth to bedrock	2-3m
Existing constraints	Older abandoned workings to the north, very limited area
Services	None
Evidence of Historic Mine Workings	Winsers Mine to the north
Depth to workings	>50m
Age of workings	1985-90, limited older workings in extreme north of site (1896) from Winsers Mine
Mining Void	2.5 m maximum
Void to Rock Ratio	>10:1
Type of Workings	Pillar and Room regular design
Evidence of subsidence	None evident
Mining Risk to Solar Farm	Negligible
Mining Risk to Infrastructure	Negligible
Is site suitable for solar panels	Yes, on flatter area to the north
Is site suitable for infrastructure	Yes, on flatter area to the north
OVERALL MINING RISK	**NEGLIGIBLE**

Area 1/5 Looking Northeast

Site Location	Area 1/6
Current Use	Agriculture - arable
Slope	Mainly flat lying with steeper slope (>10%) to south over 80% of site
Soil type	Slightly clayey soils
Geology	Triassic calcareous mudstones of the Barnstone Member, overlying the Cotham Member, the Westbury Formation and the Blue Anchor Formation (gypsum)
Depth to bedrock	2-3m
Existing constraints	Slope to the south >10%
Services	None
Evidence of Historic Mine Workings	Kingston Mine entrance to south
Depth to workings	>50m dropping to around 40m to south of site
Age of workings	1985-90, limited older workings in extreme southwest of site
Mining Void	2.5 m maximum
Void to Rock Ratio	>10:1
Type of Workings	Pillar and Room regular design except for small area of older workings
Evidence of subsidence	None evident
Mining Risk to Solar Farm	Negligible
Mining Risk to Infrastructure	Negligible
Is site suitable for solar panels	No too steep
Is site suitable for infrastructure	No too steep
OVERALL MINING RISK	**NEGLIGIBLE**

Area 1/6 looking Southeast

Site Location	Area 1/7
Current Use	Agriculture - arable
Slope	Mainly flat lying over entire site
Soil type	Slightly clayey soils
Geology	Triassic calcareous mudstones of the Barnstone Member, overlying the Cotham Member, the Westbury Formation and the Blue Anchor Formation (gypsum)
Depth to bedrock	2-3m
Existing constraints	Localised subsidence
Services	None
Evidence of Historic Mine Workings	Kingston Mine entrance to west
Depth to workings	60m dropping to around 40m to south of site
Age of workings	1985-90, older workings in south of site 1900-1940
Mining Void	2.5 m maximum
Void to Rock Ratio	>10:1
Type of Workings	Pillar and Room regular design except for small area of older workings
Evidence of subsidence	Some evidence of subsidence in southern portion over older workings
Mining Risk to Solar Farm	Medium but only in localised area
Mining Risk to Infrastructure	Medium but only in localised area
Is site suitable for solar panels	Yes, on flatter area to the north
Is site suitable for infrastructure	Yes, on flatter area to the north
OVERALL MINING RISK	**LOW with isolated areas of MEDIUM**

Area 1/7 looking Northwest

Site Location	Area 1/8, 9, 10,
Current Use	Agriculture - arable
Slope	Mainly flat lying over entire site
Soil type	Slightly clayey soils
Geology	Triassic calcareous mudstones of the Barnstone Member, overlying the Cotham Member, the Westbury Formation and the Blue Anchor Formation (gypsum)
Depth to bedrock	2-3m
Existing constraints	Localised subsidence
Services	Buried oil pipeline 1/9 and telecommunications mast 1/8
Evidence of Historic Mine Workings	Kingston Mine entrance to west
Depth to workings	60-65m
Age of workings	1900-1940, younger workings in east of site 1980-1985 (1/12)
Mining Void	2.5 m maximum
Void to Rock Ratio	>10:1
Type of Workings	Pillar and Room irregular design except for small area of younger workings in extreme east with a regular mine layout
Evidence of subsidence	Localised areas evident as identified in Crown Hole and Subsidence Plan
Mining Risk to Solar Farm	Medium however low potential risk over larger area
Mining Risk to Infrastructure	Medium however low potential risk over larger area
Is site suitable for solar panels	Yes, on flatter area to the north, however subsidence risk should be noted
Is site suitable for infrastructure	Yes, on flatter area to the north
OVERALL MINING RISK	**LOW with isolated areas of MEDIUM**

Area 1/8 looking North

Site Location	Area 1/11,12
Current Use	Agriculture - arable
Slope	Mainly flat lying over entire site
Soil type	Slightly clayey soils
Geology	Triassic calcareous mudstones of the Barnstone Member, overlying the Cotham Member, the Westbury Formation and the Blue Anchor Formation (gypsum)
Depth to bedrock	2-3m
Existing constraints	Localised subsidence
Services	Buried oil pipeline 1/9 and telecommunications mast 1/8
Evidence of Historic Mine Workings	Kingston Mine entrance to west
Depth to workings	60-65m
Age of workings	1900-1940, younger workings in east of site 1980-1985 (1/12)
Mining Void	2.5 m maximum
Void to Rock Ratio	>10:1
Type of Workings	Pillar and Room irregular design except for small area of younger workings in extreme east with a regular mine layout
Evidence of subsidence	Localised areas evident as identified in Crown Hole and Subsidence Plan
Mining Risk to Solar Farm	Medium however low potential risk over larger area
Mining Risk to Infrastructure	Medium however low potential risk over larger area
Is site suitable for solar panels	Yes, on flatter area to the north, however subsidence risk should be noted
Is site suitable for infrastructure	Yes, on flatter area to the north
OVERALL MINING RISK	**NO RISK TO LOW with isolated areas of MEDIUM**

Area 1/11 looking North

Site Location	Area 2/1
Current Use	Agriculture - arable
Slope	Sloping to south over entire site (<10%)
Soil type	Slightly clayey soils
Geology	Glacial Till overlying Triassic calcareous mudstones of the Barnstone Member, overlying the Cotham Member, the Westbury Formation and the Blue Anchor Formation (gypsum)
Depth to bedrock	2-3m
Existing constraints	None
Services	None
Evidence of Historic Mine Workings	None
Depth to workings	60-65m
Age of workings	1980-85, with older workings to northeast 1940-1960
Mining Void	2.5 m maximum
Void to Rock Ratio	>10:1
Type of Workings	Pillar and Room regular design except for small area of older workings in extreme east with an irregular mine layout
Evidence of subsidence	None
Mining Risk to Solar Farm	Low
Mining Risk to Infrastructure	Low
Is site suitable for solar panels	Yes
Is site suitable for infrastructure	Yes
OVERALL MINING RISK	**NO RISK TO NEGLIGIBLE TO LOW**

Area 2/1 looking North

Site Location	Area 2/2
Current Use	Agriculture - arable
Slope	Sloping to southwest over entire site (>10%)
Soil type	Slightly clayey soils
Geology	Glacial Till overlying Triassic calcareous mudstones of the Barnstone Member, overlying the Cotham Member, the Westbury Formation and the Blue Anchor Formation (gypsum)
Depth to bedrock	2-3m
Existing constraints	Slope
Services	None
Evidence of Historic Mine Workings	None
Depth to workings	>50m
Age of workings	1980-85
Mining Void	2.5 m maximum
Void to Rock Ratio	>10:1
Type of Workings	Pillar and Room regular design
Evidence of subsidence	None
Mining Risk to Solar Farm	Negligible
Mining Risk to Infrastructure	Negligible
Is site suitable for solar panels	Yes, on flatter area to the north but limited in extent due to slope
Is site suitable for infrastructure	Yes, on flatter area to the north but limited in extent due to slope
OVERALL MINING RISK	**NEGLIGIBLE**

Area 2/2 looking South

Site Location	Area 2/3
Current Use	Agriculture - arable
Slope	Sloping to east over entire site (<10%)
Soil type	Slightly clayey soils
Geology	Glacial Till overlying Triassic calcareous mudstones of the Barnstone Member, overlying the Cotham Member, the Westbury Formation and the Blue Anchor Formation (gypsum)
Depth to bedrock	2-3m
Existing constraints	None
Services	None
Evidence of Historic Mine Workings	None
Depth to workings	>50m
Age of workings	1980-85
Mining Void	2.5 m maximum
Void to Rock Ratio	>10:1
Type of Workings	Pillar and Room regular design
Evidence of subsidence	None
Mining Risk to Solar Farm	Negligible
Mining Risk to Infrastructure	Negligible
Is site suitable for solar panels	Yes, on flatter area to the north but limited in extent due to slope
Is site suitable for infrastructure	Yes, on flatter area to the north but limited in extent due to slope
OVERALL MINING RISK	**NEGLIGIBLE**

Area 2/3 looking North

Site Location	Area 2/4
Current Use	Agriculture - arable
Slope	Sloping to south over entire site
Soil type	Slightly clayey soils
Geology	Glacial Till overlying Triassic calcareous mudstones of the Barnstone Member, overlying the Cotham Member, the Westbury Formation and the Blue Anchor Formation (gypsum)
Depth to bedrock	2-3m
Existing constraints	None
Services	None
Evidence of Historic Mine Workings	None
Depth to workings	>5m
Age of workings	1980-85
Mining Void	2.5 m maximum
Void to Rock Ratio	>10:1
Type of Workings	Pillar and Room regular design
Evidence of subsidence	None
Mining Risk to Solar Farm	Low
Mining Risk to Infrastructure	Low
Is site suitable for solar panels	Yes, on flatter area to the north but limited in extent due to steep slope
Is site suitable for infrastructure	Yes, on flatter area to the north but limited in extent due to steep slope
OVERALL MINING RISK	**LOW with isolated areas of MEDIUM**

Area 2/4 looking Southwest

Site Location	Area 2/5
Current Use	Agriculture - arable
Slope	Sloping to south over entire site
Soil type	Slightly clayey soils
Geology	Glacial Till overlying Triassic calcareous mudstones of the Barnstone Member, overlying the Cotham Member, the Westbury Formation and the Blue Anchor Formation (gypsum)
Depth to bedrock	2-3m
Existing constraints	None
Services	None
Evidence of Historic Mine Workings	None
Depth to workings	60-65m
Age of workings	1980-85, with older workings to northeast 1940-1960
Mining Void	2.5 m maximum
Void to Rock Ratio	>10:1
Type of Workings	Pillar and Room regular design except for small area of older workings in extreme east with an irregular mine layout
Evidence of subsidence	None
Mining Risk to Solar Farm	Low
Mining Risk to Infrastructure	Low
Is site suitable for solar panels	Yes
Is site suitable for infrastructure	Yes
OVERALL MINING RISK	**NEGLIGIBLE TO LOW**

Area 2/5 looking North

Site Location	Area 3/1
Current Use	Agriculture - arable
Slope	Mainly flat lying over entire site
Soil type	Slightly clayey soils
Geology	Triassic calcareous mudstones of the Barnstone Member, overlying the Cotham Member, the Westbury Formation and the Blue Anchor Formation (gypsum)
Depth to bedrock	2-3m
Existing constraints	Slope to the southeast very gentle
Services	None
Evidence of Historic Mine Workings	Glebe Mine entrance to southeast of site
Depth to workings	60-65m
Age of workings	1975-1980
Mining Void	2.5 m maximum
Void to Rock Ratio	>10:1
Type of Workings	Pillar and Room regular design
Evidence of subsidence	None
Mining Risk to Solar Farm	Negligible
Mining Risk to Infrastructure	Negligible
Is site suitable for solar panels	Yes, on flat area
Is site suitable for infrastructure	Yes, on flat area
OVERALL MINING RISK	**NO RISK TO NEGLIGIBLE**

Area 3/1 looking North

Site Location	Area 3/2
Current Use	Agriculture - arable
Slope	Mainly flat lying over entire site
Soil type	Slightly clayey soils
Geology	Triassic calcareous mudstones of the Barnstone Member, overlying the Cotham Member, the Westbury Formation and the Blue Anchor Formation (gypsum)
Depth to bedrock	2-3m
Existing constraints	Slope to the southeast very gentle
Services	None
Evidence of Historic Mine Workings	Glebe Mine entrance to southeast of site
Depth to workings	60-65m
Age of workings	1940-1960
Mining Void	2.5 m maximum
Void to Rock Ratio	>10:1
Type of Workings	Pillar and Room regular design
Evidence of subsidence	None
Mining Risk to Solar Farm	Low
Mining Risk to Infrastructure	Low
Is site suitable for solar panels	Yes, on flat area
Is site suitable for infrastructure	Yes, on flat area
OVERALL MINING RISK	**NO RISK TO NEGLIGIBLE TO LOW**

Area 3/2 Looking West

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