



## Appendix E – Grid Capacity Analysis



# Grid Capacity Analysis

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## The Appeal Site

This Grid Capacity Analysis has been prepared by RES Ltd to accompany the Statement of Case for the Kingston Solar Farm (“the Proposed Development”), approximately 1.3km south of Gotham and 0.75km northwest of East Leake (“the Appeal Site”).

## Grid Capacity across the UK

Viable grid connections across the UK are few and far between. This is largely due to the decarbonisation of our energy system as we move from having large carbon producing power plants dotted across the network, to a more distributed system of renewable energy projects that power the grid with clean green electricity at the lowest cost to the consumer<sup>1</sup>.

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[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/911817/electricity-generation-cost-report-2020.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/911817/electricity-generation-cost-report-2020.pdf)

As described in the Electricity Networks Commissioner report<sup>2</sup> published on 3rd August 2023 ‘...there is an expectation for a five-fold increase in solar deployment of up to 70GW, by 2035<sup>3</sup>. Electricity demand is expected to increase two-fold or more by 2050 as different sectors - including transport, heat and industry - electrify<sup>4</sup>. Supporting this growth will require transformation of the energy system, including the electricity transmission network that will connect clean generation capacity to demand centres, many of which could be in distant locations. Transmission network build will be needed at an unprecedented scale and pace.

*The UK has been successful in stimulating investment in generation from renewables but there has not been commensurate investment in transmission networks. This means that the ‘queue’ to connect to the transmission grid is extremely congested, with more than 230GW of generation projects in the connection queue (compared to c.80GW of generation currently connected).<sup>5</sup> This has resulted in renewable energy developers and other connection customers receiving connection offers for the 2030s, slowing the energy transition.’*

## Grid Capacity at the Appeal Site

Ratcliffe on Soar was identified as being of interest due to the decommissioning of the coal plant and the opportunity to make use of existing infrastructure at Ratcliffe on Soar.

A grid application for the Proposed Development was submitted by RES Ltd in Autumn 2020 to connect into the Distribution Network at the Appeal Site (“the Grid Application”) following discussions with the Distribution Network Operator, National Grid Electricity Distribution (“NGED” (formerly Western Power Distribution)), which indicated that there was capacity available on the local 132kV network between Ratcliffe-on-Soar and Willoughby (“the 132kV circuit”). The 132kV circuit lies 240m north of the Appeal Site and is shown on **Figure 1: 132kV grid route - Ratcliffe-on-Soar to Willoughby**.

As shown on Figure 1, the 132kV circuit is a mixture of overhead line (“OHL”) and underground cable (“UGC”). Most of the route is OHL, circa 22km (shown in blue), with a small portion, circa 5km, closer to Ratcliffe-On-Soar being UGC (shown in pink).

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<sup>2</sup>

[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/1175647/electricity-networks-commissioner-companion-report.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1175647/electricity-networks-commissioner-companion-report.pdf)

<sup>3</sup> <https://www.gov.uk/government/publications/british-energy-security-strategy/british-energy-security-strategy>

<sup>4</sup> [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/1096248/electricity-networks-strategic-framework-appendix-1-electricity-networks-modelling.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1096248/electricity-networks-strategic-framework-appendix-1-electricity-networks-modelling.pdf)

<sup>5</sup> <https://www.nationalgrideso.com/industry-information/connections/connections-reform>

Figure 1

132kV grid route - Ratcliffe-On-Soar to Willoughby



NGED confirmed that the 49.9MW capacity was only available on the UGC section of the local 132kV circuit. A connection on the OHL section would have been technically possible but would have required reinforcement from wherever a potential site connected, back to the location where the circuit becomes underground. Therefore, this was not the least cost option (which is always recommended by the DNO) and would likely make a connection to the OHL unviable economically. This is covered in more detail under the later section ‘Economic Viability’.

Due to the early engagement with NGED, RES Ltd secured a viable grid connection with the point of connection (“PoC”) being along the underground section of the 132kV circuit, at a point 0.3km from the Appeal Site. The project has a connection date in 2026.<sup>6</sup> Comparatively, the renewable energy sector is now seeing grid connection dates in the mid-2030s. The Proposed

<sup>6</sup> In the event the Proposed Development had been consented by the local planning authority, it would have been programmed to connect to the Grid in 2025



Development's early connection date sets it apart from the wider sector and ensures it can begin delivering clean energy to the National Grid ("Grid") imminently.

Following submission of the Grid Application, National Grid ESO confirmed that the Proposed Development can connect to the Grid without the need for additional works required on the transmission system, subject to certain technical conditions. This is important for the Proposed Development, as it minimises the need for new infrastructure to enable the connection and means the Proposed Development can connect to the Grid sooner. This is becoming an increasingly rare opportunity for clean energy developers and will allow the Proposed Development to begin making a significant contribution to the UK's Net Zero by 2050 target earlier than comparative schemes.

## Viable Connection

The Appeal Site being located close to a viable PoC of the existing electricity infrastructure increases the viability of the Proposed Development as the grid connection can be made whilst:

- maximising the use of existing grid infrastructure;
- minimising disruption to the local community and biodiversity; and
- reducing energy losses and overall costs of the connection.

## Economic Viability

A scheme of equal size to the Proposed Development must usually connect to the Grid at 132kV extra high voltage line to export electricity.

There is a significant cost for new 132kV cable required to connect the generation to the PoC which is in the region of £1million per kilometer. Therefore, in this case, the Proposed Development's substation cannot be more than 2km from the PoC as further distances incur excessive connection costs and make the production of clean, renewable energy commercially unviable.

As stated above, any point of connection into the OHL section of the circuit, rather than the UGC section, would require reinforcement of the OHL, meaning that the connection would most likely be commercially unviable.

Where a site is located at the closest point to the 132kV network at a point that is OHL, there are two options to connect. One is to reinforce the OHL from the point of connection on the OHL back to the point where the OHL turns into UGC. The other is to run a new 132kV cable route from that site, back to the where the circuit turns to UGC.

The DNO is legally bound to provide a customer with the least cost option, however where these distances are significant, either of these options would incur significant cost and make a project unviable.

## Electrical Viability

Together with the above, there are other factors that impact a scheme's electrical viability:

- Generated power flows from a lower voltage system to a higher voltage system, in this case from Willoughby Bulk Supply Point to Ratcliffe on Soar Grid Supply Point (“GSP”);
- To prevent line losses occurring along the energy network, it is preferable to connect to the 132kV line nearest the GSP; and
- The further a scheme is located from the GSP the higher the risk it will be unviable due to voltage drop, which could result in the generator being outside of statutory limits. Statutory limits are governed by the Electricity Act 1989.
- If a scheme was connecting into the OHL, it would also be subject to curtailment during abnormal running arrangements, or outages on the circuit.
- NGED insisted a looped connection would be needed to reduce the risk of outages on the 132kV tower line. To minimise both grid connection costs (it is more costly to work at height than it is to connect an underground cable (UGC)) and also landscape and visual impact, the looped connection was deemed necessary at the UGC section of 132kV Network.
- Based on conversations with NGED at the time of grid application, the OHL section of the 132kV circuit was not suitably rated to connect the scheme. The UGC sections however were suitably rated to accommodate additional capacity back to the GSP.
- Therefore the capacity at the 132kV UGC was deemed a viable connection option for a 49.9MW solar scheme.

## Potential Impact on Environment or Local Community

Grid connection infrastructure can be built either overhead or underground.

If it is built underground, it can be routed either along the local road network or through fields. Therefore the closer the PoC is to the site the less the impact on environmental constraints, for example archaeology, ecology and agriculture at the construction phase, as well as any maintenance required during the operational phase (from laying cables through fields), and the local community (from laying cables along the road network).

If grid connection infrastructure is built overhead, the local landscape can be impacted.

Therefore, the location of the Appeal Site close to a viable PoC enables the Proposed Development to maximise existing grid infrastructure and limit the additional infrastructure that needs to be constructed, consequently reducing impacts on the local community and other environmental constraints.

This also results in a more efficient development, which is of the lowest cost to the consumer<sup>7</sup>.

The connection route for the Proposed Development is 0.3km, with 0.2km along a minor road and 0.1km through a field. It is expected to have minimal impacts on the local environment and the impact to the local community during construction will be minimised by the proposed mitigation measures outlined in the Construction Traffic Management Plan (**Volume 3, Technical Appendix 5**).

## Alternatives Assessment

A Green Belt Assessment document was submitted in December 2022, this can be seen at **Appendix C** to the Statement of Case. This identified that 96.3% of the land within the study zone (a 2km radius of the PoC) is Green Belt, with the remaining area under development (initial Green Belt Assessment drawing can be see below at Figure 2).

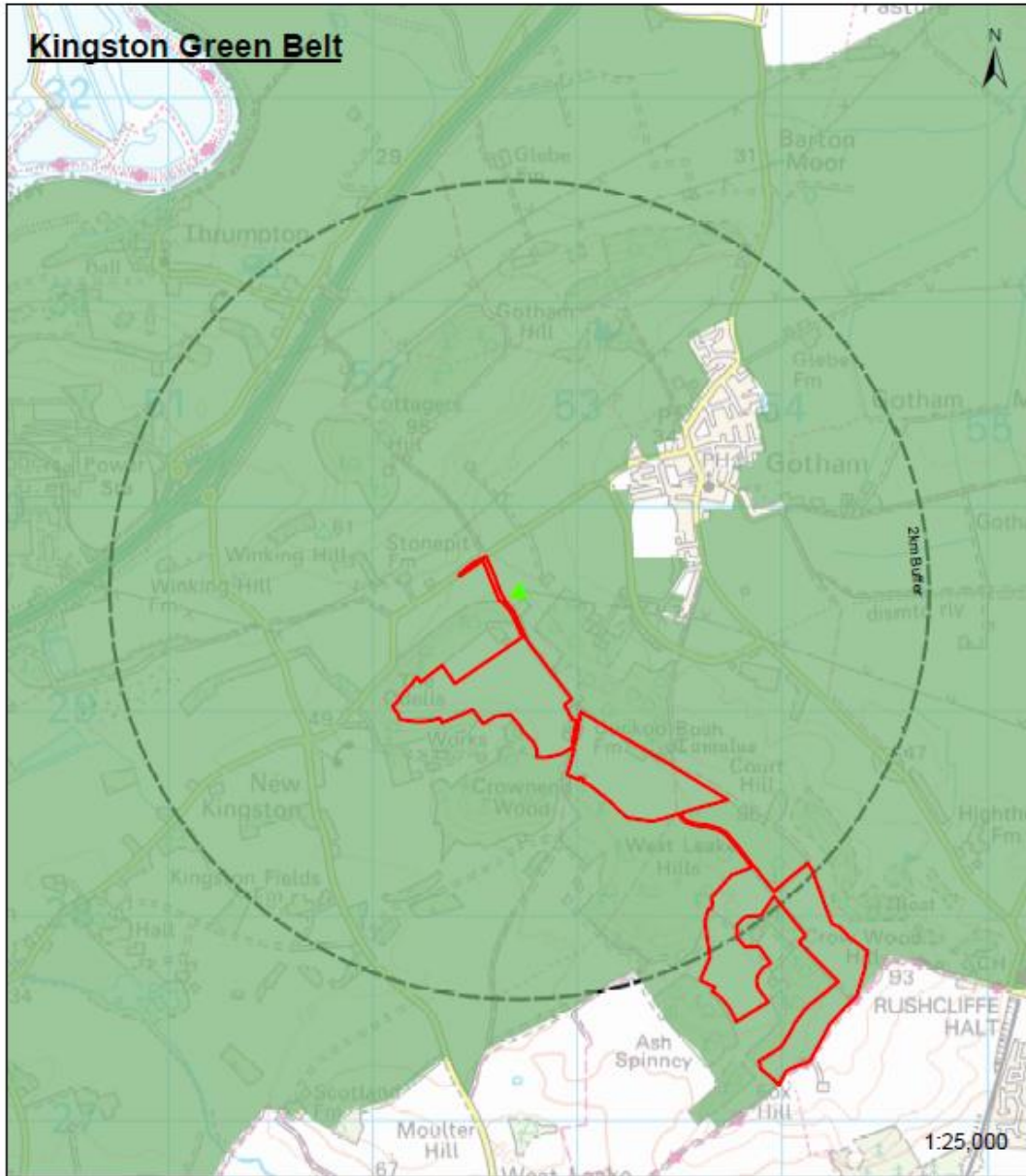
To further support this Appeal and to assist the Inspector, RES Ltd has undertaken a wider alternatives analysis exercise which is detailed below. RES Ltd felt that the application for the Appeal Site was supported adequately by the Green Belt Assessment first submitted but is taking the opportunity to develop its appeal case further with this more detailed analysis.

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[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/911817/electricity-generation-cost-report-2020.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/911817/electricity-generation-cost-report-2020.pdf)

Figure 2



**KEY:**

-  Point of Connection
-  Planning Boundary
-  Green Belt within Rushcliffe = 39.7%
-  2km Buffer

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Ordnance Survey 0100031673



A search area was defined to include land within 2km of the 132kV line, as beyond this an economically and electrically viable scheme could not be achieved.

Several key criteria were considered in order to confirm site suitability, including:

- Land size;
- Environmental, archaeological and landscape designations - each of which should be avoided as far as possible;
- Local policy designations;
- Landscape and Visual Impacts - for example, sites with established hedgerow and tree screening;
- Local receptors - roads, rail, houses etc.;
- Cultural Heritage Impacts - for example on listed buildings;
- Access - viable access routes for both construction and operational phases are required;
- Best and most versatile land - to be avoided as far as possible;
- Flood Zones 2 and 3 - to be avoided as far as possible;
- Land gradient - a gradient of more than 10 degrees should be avoided; and
- Land availability - land to be considered must be owned by a willing landowner and available for the duration of the proposal.

A 300-acre minimum is used as a starting point for a 49.9MW grid connection. This allows for the project area to reduce following the results of survey work and detailed constraints mapping, and for the design to be iteratively refined through the process. Landholdings of 170 acres have also been assessed to reflect the current area of the Appeal Site following repeated design iterations.

Only single landowner parcels have been considered in this analysis as multiple adds an additional constraint, so this is avoided where possible at the early site searching stage.

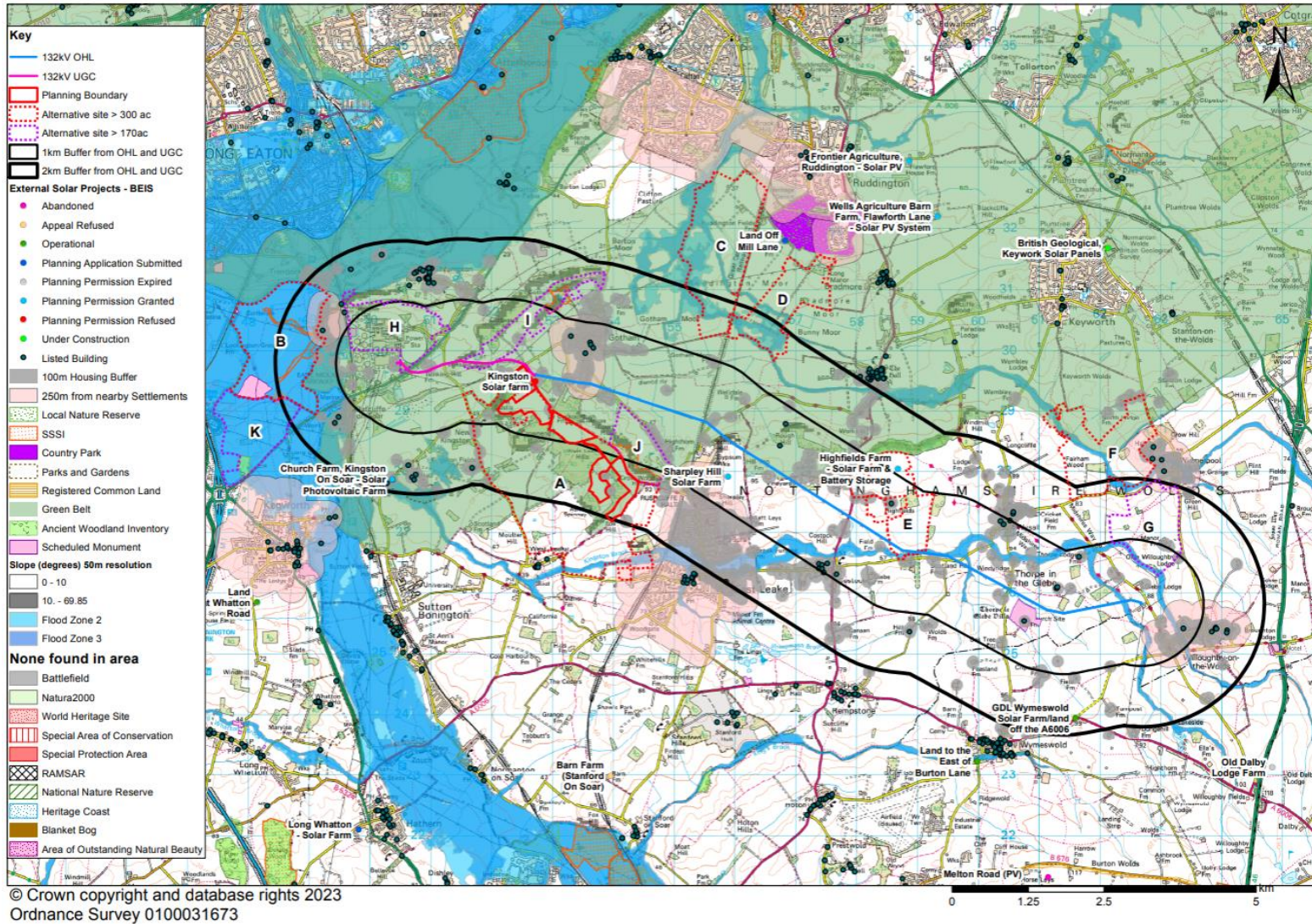
The search area, the 132kV circuit and all relevant constraints considered in this alternatives assessment are shown on Figure 3: Kingston Alternatives. This figure also shows landholdings:

- over 300 acres (shown in red dash); and
- over 170 acres (shown in purple dash).

11 landholdings were identified and assessed against the criteria set out above. The findings are summarised in the table below.

Figure 3

Kingston Alternatives



Area	Commentary with RAG rating system
A (the Appeal Site)	<ul style="list-style-type: none"> <li>• Large land parcel (circa 800 acres)</li> <li>• Outside of any ecology, archaeology and landscape designations</li> <li>• Land is within Nottingham and Derby Green Belt</li> <li>• Well screened due to existing boundary vegetation and woodland</li> <li>• A good distance from road and rail receptors, limiting any impact on them</li> <li>• Public rights of way adjacent to and across site</li> <li>• The closest settlement area lies 0.75km southeast, with few residences within close proximity</li> <li>• No Scheduled Monuments, Historic Parks and Gardens, Grade I, II* or II Listed Buildings within the Appeal Site</li> <li>• Site Access - a viable access route via Wood Lane for both construction and operational phases</li> <li>• No best and most versatile agricultural land</li> <li>• Entirely within Flood Zone 1</li> <li>• Fields located on a gentle south facing slope in the main</li> <li>• Land available from a willing landowner for the duration of the 40-year operational period</li> </ul>
Conclusion	<p>Site A is the Appeal Site, Kingston Solar Farm.</p> <p>In addition to the commentary on the constraints above, the site is close to the local grid network (circa 240m to UGC meaning no reinforcement is required along the 132kV network) and close to the GSP (circa 2.5km).</p> <p><b>From a review of the constraints, Green Belt is considered to be the only significant constraint, and therefore this is a suitable site for a solar farm of this scale.</b></p>

B

- Large land parcel (circa 570 acres)
- Two SSSIs and scheduled monument within the site
- Land outside of Nottingham and Derby Green Belt
- Full land parcel not assessed for screening due to land being ruled out for other reasons
- Properties along northern and eastern boundaries
- Listed building to eastern boundary
- Access options look to be available
- No best and most versatile agricultural land
- Entirely within Flood Zone 3
- Land looks to be fairly flat
- Landowner not interested



<p>Conclusion</p>	<p>Site B is a large land parcel; however, it has some considerable constraints. The whole of the site is in flood zone 3 (with significant flood depths due the proximity of the land to the River Soar on both northern and eastern boundaries) which makes it unsuitable for a solar farm given the requirements in planning policy to make development remain operationally safe in times of flood and to locate in areas of lower vulnerability to flooding.</p> <p>There are two SSSIs and a Scheduled Monument within the landholding which could potentially be impacted by a solar farm. There are also properties to the eastern boundary, one of which is a listed building.</p> <p>The land is also 2.9km from East Midlands airport. Whilst this would not necessarily rule out development of the site it would require further investigation and consideration in design.</p> <p>Additionally, the majority of the land within 2km of the 132kV UGC is separated from it by a railway line and the River Soar, making a grid connection to the 132kV UGC challenging from an engineering perspective and with increased associated cost and disruption.</p> <p>The landowner has been contacted multiple times but did not respond, therefore is deemed not interested in progressing a potential solar project.</p> <p><b>This site is therefore considered to be an unsuitable alternative to the Appeal Site.</b></p>
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<p>C</p>	<ul style="list-style-type: none"> <li>• Large land parcel (circa 580 acres)</li> <li>• No environmental, archaeological and landscape designations within the site</li> <li>• Close proximity to a Country Park (circa 150m)</li> <li>• Land is within Nottingham and Derby Green Belt</li> <li>• Full land parcel not assessed for screening due land being ruled out for other reasons</li> <li>• Towns of Clifton (circa 250m) and Ruddington (circa 100m) in close proximity</li> <li>• Multiple listed buildings in Ruddington</li> <li>• Access options look to be available</li> <li>• Large % of grade 2 land (best and most versatile)</li> <li>• Large areas of Flood Zones 2 and 3</li> <li>• Land looks to be fairly flat</li> <li>• Land availability unknown</li> </ul>
<p>Conclusion</p>	<p>Site C is a large enough land parcel; however, it has some considerable constraints. The land is in close proximity to a Country Park, a large proportion of the land is grade 2 agricultural land, a large area of the land is in flood zones 2 &amp; 3, and the land is in close proximity of two towns, one of which has multiple listed buildings. The land is also within the Green Belt.</p> <p>Flood zone 3 makes the land unsuitable for a solar farm given the requirements in planning policy to make development remain operationally safe in times of flood and to locate in areas of lower vulnerability to flooding.</p> <p>In addition, the land is circa 1.3km from the grid network (4 times further than the Appeal Site) leading to greater grid connection costs and impact on local community or environment. It is also closest to the OHL section of the 132kV network, meaning that reinforcement would be required along this OHL section, which would incur significant cost. The land is also circa 5.1km from the GSP leading to additional line losses.</p> <p><b>This site is therefore considered to be an unsuitable alternative to the Appeal Site.</b></p>

<p>D</p>	<ul style="list-style-type: none"> <li>• Adequate land parcel (circa 300 acres)</li> <li>• No environmental, archaeological and landscape designations within the site</li> <li>• Close proximity to a Country Park</li> <li>• Land is within Nottingham and Derby Green Belt</li> <li>• Full land parcel not assessed for screening due land being ruled out for other reasons</li> <li>• Ruddington village (circa 150m) in close proximity</li> <li>• Multiple listed buildings in Ruddington</li> <li>• Access options look to be available</li> <li>• Large % of grade 2 land (best and most versatile)</li> <li>• Large areas of Flood Zones 2 and 3</li> <li>• Land looks to be fairly flat</li> <li>• Land availability unknown</li> </ul>
<p>Conclusion</p>	<p>Site D has some similar constraints to site C. It is a large enough land parcel, but has some considerable constraints. The land is in close proximity to a Country Park, a large proportion of the land is grade 2, a large portion is in flood zones 2 and 3, and the land is in close proximity of Ruddington, which has multiple listed buildings. The land is also within the Green Belt.</p> <p>Flood zone 3 makes the land unsuitable for a solar farm given the requirements in planning policy to make development remain operationally safe in times of flood and to locate in areas of lower vulnerability to flooding.</p> <p>In addition, the site is circa 1.3km from the grid network (5 times further than the Appeal Site) leading to greater grid connection costs and impact on local community or environment. It is also closest to the OHL section of the 132kV network, meaning that reinforcement would be required along this OHL section, which would incur significant cost. The land is also circa 5.6km from the GSP leading to additional line losses.</p> <p><b>This site is therefore considered to be an unsuitable alternative to the Appeal Site.</b></p>

E	<ul style="list-style-type: none"> <li>• Already a consented solar farm and therefore not available for development.</li> </ul>
Conclusion	<p>Already a consented solar farm. No further analysis undertaken.</p> <p><b>This site is considered to be an unsuitable alternative to the Appeal Site.</b></p>
F	<ul style="list-style-type: none"> <li>• Large land area, circa 420 acres</li> <li>• No environmental, archaeological and landscape designations within the site</li> <li>• Circa 170 acres, around half of land, is within Nottingham and Derby Green Belt</li> <li>• Full land parcel not assessed for screening due land being ruled out for other reasons</li> <li>• Widmerpool village immediately adjacent</li> <li>• Multiple listed buildings in Widmerpool</li> <li>• Access options look to be available</li> <li>• Small areas of grade 2 best and most versatile land to be avoided</li> <li>• Small areas of flood Zones 2 and 3 to be avoided</li> <li>• Land looks to be fairly flat</li> <li>• Land availability unknown</li> </ul>

<p>Conclusion</p>	<p>Site F seems at first glance to be a large enough land parcel, however once the desktop assessment of the key constraints is done, this area is much reduced. Only circa 200 acres remain once high level constraints have been removed (Green Belt, 250m buffer on settlements, areas of woodland and flood zone 3 etc).</p> <p>Critically the land is in close proximity to the settlement of Widmerpool, and so there would need to be a setback from the village to reduce impacts. A 250 m setback from Widmerpool has been used at this early stage, as further assessment would be required to ascertain what views might be possible from the village and from each of the heritage assets. This reduces the available area for development. There are several areas of woodland within the site area, which would further reduce buildable area. There are two rivers that run through the site, which must also be removed from the buildable area.</p> <p>Over half of the land (circa 170 acres) is within the Green Belt.</p> <p>Once the above constraints are taken into account, only circa 155 acres remain, which is not considered sufficient for a development of this scale. This is smaller than the ideal size of land for when starting the development process. This is because during the site survey assessments, there are always additional constraints that reduce the land area further.</p> <p>In addition, the site is 1.8km from the grid network (6 times further than the Appeal Site) leading to greater grid connection costs and impact on local community or environment. It is also closest to the OHL section of the 132kV network, meaning that reinforcement would be required along this OHL section, which would incur significant cost. This land is almost at the furthest point from GSP (circa 12.3km) leading to additional line losses.</p> <p><b>This site could potentially be viable for solar development, but as a much smaller site, subject to a more detailed assessment being carried out. Given the global climate crisis, RES Ltd considers that each viable site is developed to help the UK meet its legally binding targets and get to net zero.</b></p> <p><b>However, due to half of the land being in the Green Belt, and the additional constraints outlined above the site is not considered to be a suitable alternative to the Appeal Site.</b></p>
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G

- Adequate land parcel (Circa 295 acres)
- No environmental, archaeological and landscape designations within the site
- Land outside of Nottingham and Derby Green Belt
- Land looks to be very visible from the eastern side along Willoughby Road and the northern side from the farm entrance.
- Public rights of way adjacent to and across site
- Widmerpool village immediately adjacent
- Multiple listed buildings in Widmerpool
- Access options look to be available
- No best and most versatile land
- Small areas of flood Zones 2 and 3 to be avoided
- Land looks to be undulating with some areas of north facing land
- Land availability unknown



<p>Conclusion</p>	<p>Site G is similar in some ways to site F due to its proximity to Widmerpool. It is also a large enough area of land, circa 295 acres, which is much reduced once a desktop analysis of constraints is undertaken as described below.</p> <p>The land looks to be very visible from the eastern side along Willoughby Road and the northern side from the farm entrance. Therefore, large areas of the land would need to be removed from development. A lot of this land is also north facing, which is not ideal for solar development. If north facing land is used for solar, the spacing between rows of panels must be larger, taking up additional land area or reducing the number of panels that can fit in a certain land parcel, and therefore reducing the amount of generation.</p> <p>Widmerpool village, which has multiple listed buildings, is also in close proximity. A 250 m setback from Widmerpool has been used at this early stage, as further assessment would be required to ascertain what views might be possible from each of the heritage assets. This further reduces available area for development. Manor Farm and Old Willoughby Lodge would also need to be buffered and screened.</p> <p>There are two public rights of way that cross directly through the middle of the site. The public rights of way would need setback distances and buffers, which would further reduce the buildable area.</p> <p>The constraints above reduce the developable area down considerably to circa 160 acres. This is smaller than the ideal size for a site when starting the development process. This is because during the site survey assessments, there are always additional constraints that reduce the land area further.</p> <p>In addition, the site is circa 540m from the grid network (nearly twice the distance than the Appeal Site) leading to greater grid connection costs and impact on local community or environment. It is also closest to the OHL section of the 132kV network, meaning that reinforcement would be required along this OHL section, which would incur significant cost. The land is also circa 13.7km from the GSP leading to additional line losses.</p> <p><b>This site could potentially be viable for solar development, but as a much smaller site, subject to a more detailed assessment being carried out. Given the global climate crisis, RES Ltd considers that each viable site is developed to help the UK meet its legally binding targets and get to net zero. However due to the size of the landholding remaining after the initial desktop constraints review, the site is not considered to be a suitable alternative to the Appeal Site.</b></p>
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H	<ul style="list-style-type: none"> <li>• This land houses the Ratcliffe-on-Soar Power Station and so can be discounted.</li> </ul>
Conclusion	<p>Land used for power station. No further analysis undertaken as this site is considered to be unsuitable for development and consequently an <b>unsuitable alternative to the Appeal Site.</b></p>
I	<ul style="list-style-type: none"> <li>• Limited land area (circa 185 acres)</li> <li>• SSSI to the north of the site</li> <li>• Land is within Nottingham and Derby Green Belt</li> <li>• Large area of woodland to western area could screen - but only views from the motorway</li> <li>• Full land parcel not assessed for screening due land being ruled out for other reasons</li> <li>• Village of Gotham is immediately adjacent</li> <li>• Multiple listed buildings in Gotham</li> <li>• Access options look to be available</li> <li>• No best and most versatile land</li> <li>• No flood zone 2 or 3</li> <li>• Land is very steep to north and east, which makes it unsuitable for solar</li> <li>• Land availability unknown</li> </ul>
Conclusion	<p>When removing the land which is too steep to be developed for solar and the SSSI, there is only circa 110 acres available, which is considered too small for a development of this size</p> <p><b>This site is therefore considered to be an unsuitable alternative to the Appeal Site.</b></p>

<p>J</p>	<ul style="list-style-type: none"> <li>• Limited land area (circa 170 acres)</li> <li>• SSSI to the south of the site</li> <li>• Land is within Nottingham and Derby Green Belt</li> <li>• Full land parcel not assessed for screening due land being ruled out for other reasons</li> <li>• A row of properties along the road to the north would have views directly into the fields</li> <li>• No listed buildings within close proximity</li> <li>• Access options look to be available</li> <li>• No best and most versatile land</li> <li>• No Zones 2 or 3 areas</li> <li>• Land is very steep to south and west, which makes it unsuitable for solar</li> <li>• Land availability unknown</li> </ul>
<p>Conclusion</p>	<p>Site J is very similar to Site I. It is a smaller land parcel than the Appeal Site and when removing the land which is too steep to be developed for solar the SSSI, there is only circa 120 acres available.</p> <p><b>This site is therefore considered to be an unsuitable alternative the Appeal Site.</b></p>
<p>K</p>	<ul style="list-style-type: none"> <li>• Adequate land area (circa 295 acres)</li> <li>• Areas of ancient woodland</li> <li>• Land outside of Nottingham and Derby Green Belt</li> <li>• Full land parcel not assessed for screening due to land being ruled out for other reasons</li> <li>• No properties within close proximity, but surrounded by roads</li> <li>• No listed buildings close by</li> <li>• Access options look to be available</li> <li>• Small area of best and most versatile land</li> <li>• Entirely within Flood Zone 3</li> <li>• Land looks to be fairly flat</li> <li>• Landowner not interested</li> </ul>

<p>Conclusion</p>	<p>Site K is a reasonable land parcel, however it has some considerable constraints. The whole of the site is in flood zone 3, which makes it unsuitable for a solar farm given the requirements in planning policy to make development remain operationally safe in times of flood and to locate in areas of lower vulnerability to flooding.</p> <p>Additionally the majority of the land within 2km of the 132kV circuit is separated from it by a railway line and the River Soar, making a grid connection to the 132kV UGC challenging from an engineering perspective and with increased associated cost and disruption.</p> <p>The land is also 1.5km from East Midlands airport. Whilst this would not necessarily rule out development of the site it would require further investigation and consideration in design.</p> <p>The landowner has been contacted multiple times but did not respond, therefore is deemed not interested in progressing a potential site.</p> <p><b>This site is therefore considered to be an unsuitable alternative to the Appeal Site.</b></p>
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## Alternatives on Brownfield Land

The brownfield land register was also consulted, however; as noted within the Gotham Neighbourhood Plan; *“Gotham has a very limited number of sites that are Brownfield (previously used land).”* The **brownfield land register** shows that there is a total of less than 45 hectares of land split over 12 locations throughout Rushcliffe, with an average of 3.74 hectares (9.24 acres), the largest of these is 35.4 hectares (87.5 acres). **Therefore none of these land parcels are of sufficient size to support a renewable energy scheme of this scale, and capture the available grid capacity.**<sup>8</sup>

## Conclusion

This Grid Capacity Analysis shows that there is no viable alternative site location that would provide meaningfully less impact than the Appeal Site while being able to deliver equal volume of renewable electricity.

The grid connection is for 49.9MW of available capacity connecting into the 132kV network. It is considered that a site located more than 2km from the PoC would not be viable.

Constraints and landholdings within 2km of the relevant 132kV circuit were considered and 11 potential areas were assessed. Of these only Sites F and G were considered potentially viable.

Site F is further from a potential grid PoC and the second furthest site from the GSP, meaning that it would have a more expensive grid connection and greater line losses, resulting in more significant infrastructure being constructed. It is also a smaller land area than what would be considered viable for a 49.9MW site and would therefore generate less capacity. This may mean that the site is not economically viable due to the high grid costs.

Site G is also furthest from the GSP, resulting in greater line losses. It is also a smaller land area than what would be considered viable for a 49.9MW site and would therefore generate less capacity.

However, given the global climate crisis, RES Ltd. considers that it is not a case of either or, and all viable sites should be developed to help the UK meet its legally binding targets and get to Net Zero. However, developing each of Sites F and G would not only generate significantly greater planning impacts and development costs but are unlikely to in practice be taken forward due to the greater connection costs and lower capacity achieved.

Based on this analysis, the Appeal Site is therefore considered the best location to generate the available 49.9MW of renewable energy utilising the available Grid capacity, justifying its development in the Green Belt.

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<sup>8</sup> <https://www.rushcliffe.gov.uk/planningpolicy/brownfieldregister/>