7000 Acres

7000 Acres Response to the West Burton Solar Project Ltd Application on the subject of:

Flooding Concerns

Deadline 1A Submission – 7th December 2023

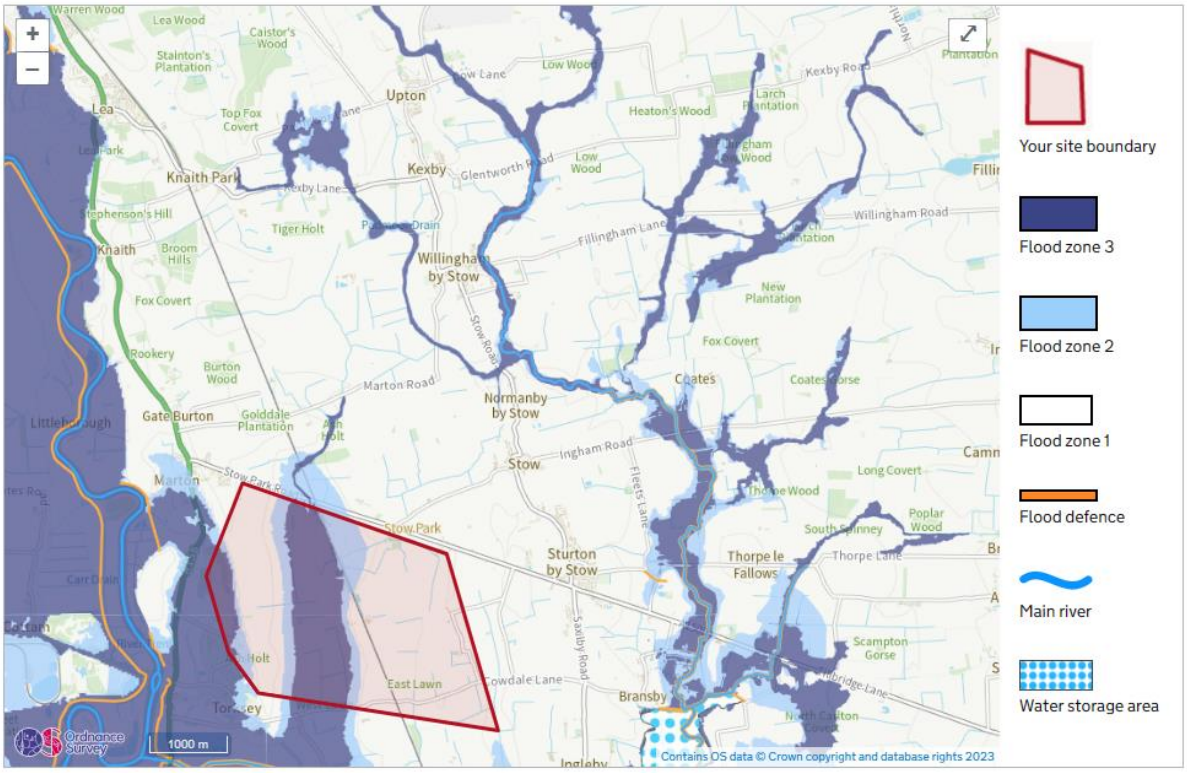
7000 Acres Group Representation

West Burton Solar Project Flooding Concerns

The West Burton Solar Project is divided into three areas denominated West Burton 1,2 & 3 and covering a total area of around 2,000 acres of productive farmland.

West Burton 1 and 2 cover almost 1,000 acres and are located on the flood plain of the River Till which is pumped into the Fossdyke Navigation Canal at Odder, adjacent to the A57 east of Saxilby.

West Burton Site 3 covers over 900 acres, located near the villages of Marton and Brampton. Parts of the site appear to be within Flood Zone 3, i.e. land with "a high probability of flooding from rivers and the sea". (See screenshot from Gov.UK flood map service).



Assuming only 50% of the total land area is covered by the 4.5-metre-high articulated panels, then the total panel surface areas are estimated to be in the order of millions of square metres across the whole West Burton scheme, a huge, impermeable surface area.

The surface water runoff under storm conditions from impervious areas of this magnitude will be spectacular.

The kinetic energy of the sheet flow from the panels is far greater than that of the rainfall over the same area and will alter the volume, velocity, and discharge characteristic of storm water runoff, increasing the soil erosion along the drip line of the panels.

The flow of rainwater falling on the panels is concentrated at the drip line and the degree of infiltration will depend on the soil permeability immediately below.

If land drains are sited immediately below the drip line, the flow of water from the site into drainage ditches are likely to be much greater than at present.

The articulated panels are 4.5 metres high, inclined at variable angles between 20 and 50 degrees depending on the season and operated to track the sun.

Rainwater falling onto the inclined panels will run to the lowest point on each array and fall to the ground at the drip line.

On level ground, the areas beneath the panels are not available for infiltration, since they lie in the rain shadow and beyond the panel drip line.

The flow of water along the ground is governed by the hydrology, which relies on rate of rainfall, the localised permeability of the soil at the drip line, the slope of the ground and the degree of compaction of the access roadways between the arrays by maintenance traffic.

Considering the above, it is highly unlikely that the 4.5-metre-high panels will allow rainfall/runoff to infiltrate the permeable area beneath and therefore will not remain consistent to its predevelopment state.

Currently rainwater precipitation and mitigation are evenly distributed across the sites allowing gradual entry into the land drainage systems before delivery into the drainage dykes.

However, rainwater falling on the panels will gravitate towards the lowest corner of each panel, where it will fall to the ground to form rivulets and channels flowing down the rain shadows of the rows sited below, without using the whole area for infiltration as the developers claim.

Additionally, much of the existing field drainage system beneath the panels will remain underutilised and subject to damage and disturbance by the panel mountings during construction.

This will increase the rate and quantity of surface water runoff from the sites, with spectacular flooding during periods of prolonged torrential rain.

If one uses the Defra SuDS mitigation requirement of one cubic metre of storage capacity for 50 square metres of impermeable surface area, a potential area of millions of square metres of solar panels would require many 10’s of thousands of cubic metres of storage.

Retaining this quantity of storm water by 0.6 metre deep ‘swales’ would require a total mitigation area of perhaps 20-30 acres distributed at the lowest points in each section of solar arrays, far exceeding any outline proposals for mitigation in the developer’s FRA and could hardly be regarded as maintaining the existing topography.

The proposed surface water drainage is based solely on the infiltration of the land in its current condition, with an even distribution of rainfall and an uncovered exposed area of permeability, but again no consideration has been given to the sheltered areas beneath the panels, which reduces the

area of direct infiltration by an estimated 50%. The runoff from the panels is concentrated at the drip line, will flow to the lowest point under gravity and will not be distributed over the total area.

In addition to the surface water from the proposed area of West Burton 1 and 2, the River Till also receives land drainage from the proposed developments at Gate Burton EP, Cottam Solar Park and Tillbridge Solar, which in total amount to around 10,000 acres of land sited in the catchment area.

The River Till is pumped up into the Fossdyke Navigation Canal by pumps controlled by the Upper Witham Drainage Board at Odder and flows into the Brayford Pool in the centre of Lincoln city which links to the river Witham.

Under storm conditions when the water level in the river Witham is high, the Upper Witham Drainage Board, at the request of the Environment Agency, routinely turn off the transfer pumps from the river Till into the Fossdyke Canal to prevent flooding around the Brayford Pool in the centre of Lincoln, causing the river Till to overflow its flood banks and inundate the surrounding farmland.

Thousands of acres of farmland and several vital access roads were affected around the villages of Stow, Sturton by Stow, Bransby and Broxholme in November 2019, which is not an isolated incident.

The flooding in 2019 also resulted in the evacuation of horses from the Brasby Horse Rescue Centre and the inundated land being unsuitable for grazing for over 12 months. A further recent instance of flooding in this area is provided as a supplement to this WR, following Storm Babet, in October 2023.

West Burton 1 and 2 is sited in flood classification zones 2 & 3 (areas with a moderate to high level of flooding) and anecdotal evidence provided by the local farming community suggest that the inundation of farmland is relatively frequent and sufficiently prolonged to have a negative impact on agricultural practices, resulting in the land being unsuitable for arable farming and converting to pasture and hay crop.

This raises serious concerns about the restriction of access by emergency services to remote communities due to the increased flood risk arising from all four solar projects sited on the catchment area of the river Till, which will inevitably exacerbate an already existing flooding problem.

It is therefore impossible to consider the effects of flooding arising from West Burton in isolation from the other 3 Solar Projects currently going through the planning process and the effects each will have jointly and severally on the inundation of farmland and roadways to villages downstream of the river Till due to drains backing up and water overflowing its flood banks.

High water levels in the river Till also exacerbate flooding problems experienced over 10 miles away, due to the reduction in the hydraulic gradient resulting from rising water levels in the drainage dykes and its tributaries.

When one considers the storm water runoff from an estimated 8 square miles of impermeable glass panels from all 4 projects delivering onto the catchment area of the river Till, the flooding will be ‘spectacular’ and no amount of ‘mitigation’ will equal that already provided by the soil itself and the existing drainage systems, which have stood the test of time.

Most of the soil on the proposed development areas has a high clay content, which despite its ability to hold water in times of drought to produce high crop yields, becomes saturated during prolonged periods of heavy rain, resulting in excess water to shed off directly over the surface into the dykes.

Also, during periods of drought, clay soil becomes hard and initially impervious to rainwater until it is softened enough to allow infiltration.

Under drought conditions, its hard impervious nature of clay soil results in rainwater from a sudden storm running off faster than it can be absorbed.

The residence time, for rainwater falling over an area of the soil surface is currently much longer than would be the case when covered by 4.5-metre-high impervious solar panels, which concentrate the runoff at the drip line.

The developer appears to have misunderstood the hydrology of a concentrated flow of rainwater running from the inclined 4.5 metre high solar panels onto the confined area of the drip line falling onto the edge of the compacted panel maintenance lanes between the solar array and the inaccessibility of the area in the sheltered rain shadow beneath the panels, resulting in at least half the area of the development being unavailable for infiltration than is currently the case.

Also, the impingement and sheer force of the fast-moving channel of water along the panel driplines to erode the soil and mobilise clay, fine particles together with natural vegetation to enter the water courses and negatively impact aquatic invertebrates and the general ecology of the dykes, drains including the river Till.

It remains a matter of serious concern that the Environment Agency and the Upper Witham Drainage Board have not also raised concerns regarding the flooding risk, which is patently obvious.

West Burton Solar Project's Flood Risk Assessment in its Environmental Statement makes scant reference to the effect the development will have on the River Till and its tributaries and appears to concentrate mainly on the flood risk to the solar arrays and equipment within the development itself.

Nowhere in the developer's Flood Risk Assessment is there an estimate of the maximum quantity of surface water running from approximately millions of square metres of solar panels.

Periods of heavy rain exceeding 50mm in a 24-hour period are not unknown in Lincolnshire which would produce 0.32 million cubic metres of surface water, much of which would not be absorbed along the panel drip line when the soil becomes saturated.

This quantity of water could not possibly be contained on the site even if Defra's SuDS formula were to be applied to provide tens of thousands of cubic metres of storage for West Burton 1 and 2 alone.

The flood risk from West Burton 1 and 2cannot be considered in isolation and the flooding risks arising from Gate Burton EP, Cottam Solar Park and Tillbridge Solar must also be jointly considered since they all are situated on the catchment area of the river Till and comprise approximately 10,000 acres of land in total.

Photographs of the flooding of the area around the proposed site of West Burton 1 which occurred in November 2019 are hereby attached.

Figure 1 - Area to the South East of Sturton By Stow towards Bransby & Broxholm

Figure 2 - Fleets Road, Sturton by Stow

Figure 3 View to east of Sturton by Stow

Figure 4 Road leading to Stow Pasture