



## Bloch Wind Farm

Technical Appendix 13.1

**From:** Andy Wells <andy.wells@caa.co.uk>  
**Sent:** 17 October 2022 15:32  
**To:** Sam Johnson  
**Subject:** 20221017 Bloch Wind Farm Lighting CAA Variation Agreement

Hi Sam,

Thank you for the proposed lighting scheme report for the Bloch planning submission and the follow-up Teams discussion this afternoon.

The proposed Bloch wind farm consists of 21 turbines. There are a range of turbine tip heights proposed, from 180 to 230 metres above ground level (AGL), all of which are in scope of the Air Navigation Order (ANO) Article 222 lighting requirements.

We note the planned additional mitigation provided by the provision of infra-red lighting for those operators who carry Night Vision Device capability.

As a result, the CAA agrees a variation to the lighting requirements specified in the ANO Article for the Bloch wind farm, under provisions given in the Air Navigation Order (ANO) Article 222 section 6, as per the following:

- medium intensity steady red (2000 candela) lights on the nacelles of turbines T01, T02, T05, T06, T07, T08, T10, T13, T14, T15, T17, T18, T20 and T21;
- a second 2000 candela light on the nacelles of the above turbines to act as alternates in the event of a failure of the main light;
- the lights on these turbines to be capable of being dimmed to 10% of peak intensity when the lowest visibility as measured at suitable points around the wind farm by visibility measuring devices exceeds 5km.

For this proposed development, Intermediate level 32 candela lights are not required to be fitted on the turbine towers.

If the proposed design of the wind farm changes (other than variations due to micrositing etc.), this is likely to require a revision to this aviation obstacle lighting variation.

Kind regards

Andy

## **Andy Wells**

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**From:** Sam Johnson <sam.johnson@res-group.com>  
**Sent:** 06 October 2022 15:56  
**To:** Andy Wells <Andrew.Wells@caa.co.uk>  
**Subject:** [External] RE: Bloch Wind Farm Lighting

Hi Andy,

RES is currently preparing the EIA for the Bloch planning submission so it would be helpful if we could agree the lighting scheme ahead of submission. Are you able to respond on the below please?

Best regards,

**Sam Johnson**  
Senior Aviation Manager

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**From:** Sam Johnson  
**Sent:** 21 September 2022 17:40  
**To:** Andy Wells <[Andrew.Wells@caa.co.uk](mailto:Andrew.Wells@caa.co.uk)>  
**Subject:** Bloch Wind Farm Lighting

Hi Andy,

RES has a development in Scotland, Bloch Wind Farm, with proposed varying tip heights of 180 m, 200 m and 230 m tip height, which will be submitted into planning this year. Taking everything into consideration, I propose we install visible lights on all turbines except T3, T4, T9, T11, T12, T16 and T19 (as shown in the attached drawing and more information below).

The coordinates are below, along with the ground height and maximum altitude of the turbine tips.

Name	X	Y	Z	Tip Height	Altitude above mean sea level at tip	2000 cd light?
T1	330671	579641	221	180	401	Y
T2	331117	579442	214	180	394	Y
T3	331233	579934	190	200	390	N
T4	330682	580233	192	230	422	N
T5	330260	580468	217	200	417	Y
T6	331349	580426	186	230	416	Y
T7	331843	580853	189	200	389	Y
T8	332252	580610	197	230	427	Y
T9	332213	580118	190	230	420	N

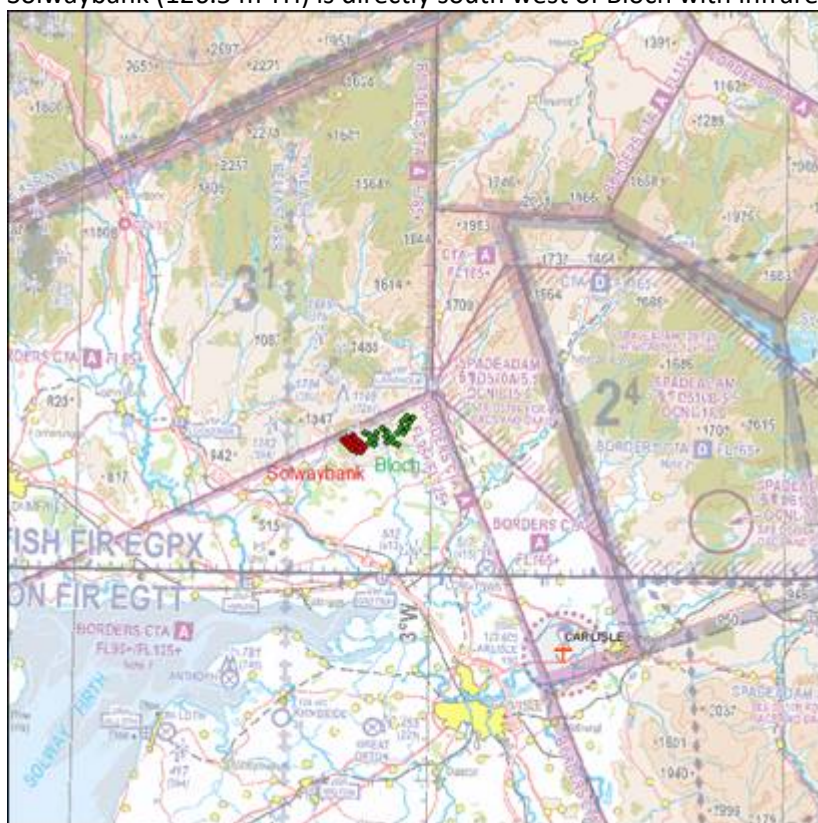
T10	332257	579636	180	230	410	Y
T11	332750	580029	175	230	405	N
T12	332803	579565	168	230	398	N
T13	333272	579391	159	200	359	Y
T14	333266	580464	178	200	378	Y
T15	333809	580437	204	200	404	Y
T16	333611	580986	205	230	435	N
T17	334128	580901	219	230	449	Y
T18	333709	581477	215	230	445	Y
T19	334307	581395	239	180	419	N
T20	334105	581903	255	180	435	Y
T21	334665	581842	253	180	433	Y

I have also provided some supporting graphics below:

1. Location of Bloch wrt operational Solwaybank Wind Farm, Carlisle Airport and RAF Spadeadam
2. Relative amsl turbine tip heights of Bloch and Solwaybank Wind Farm
3. Distance between turbines at Bloch
4. Proposed lighting scheme

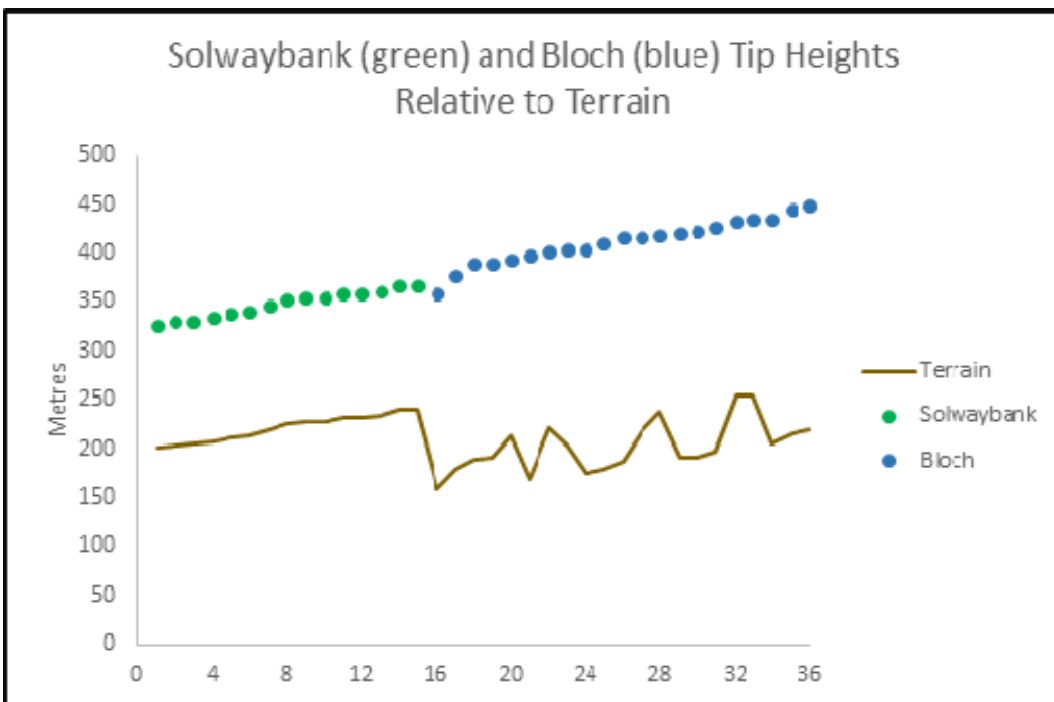
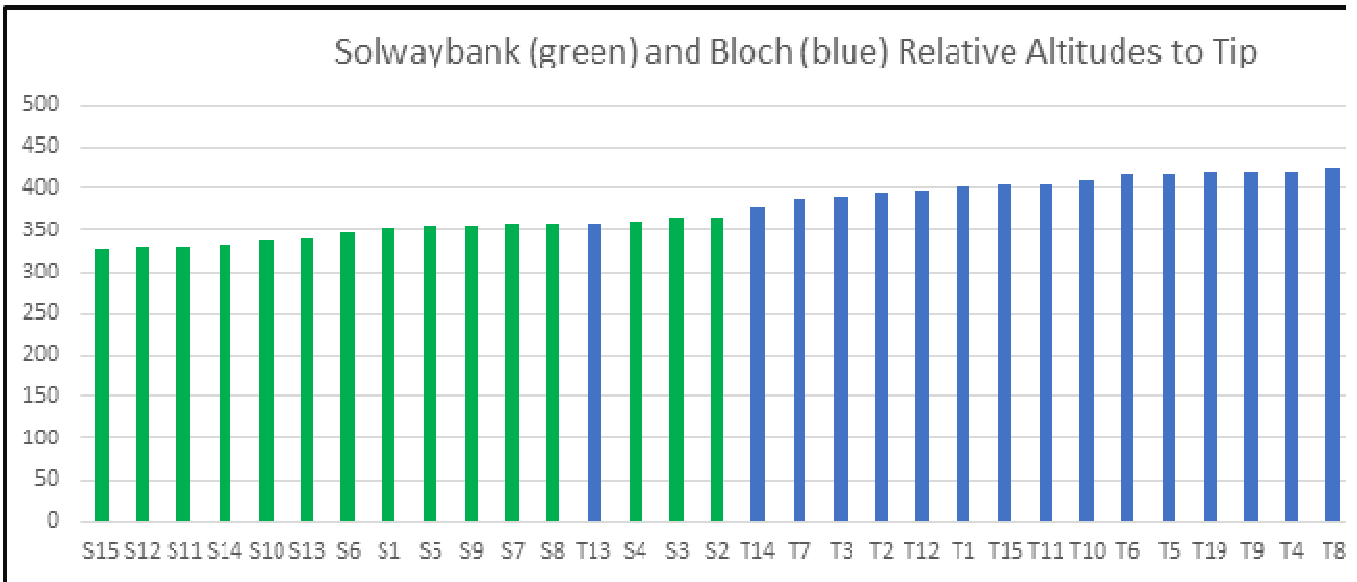
**1. Location of Bloch wrt Solwaybank Wind Farm, Carlisle Airport and the military RAF Spadeadam Range**

Solwaybank (126.5 m TH) is directly south west of Bloch with infrared aviation lighting only



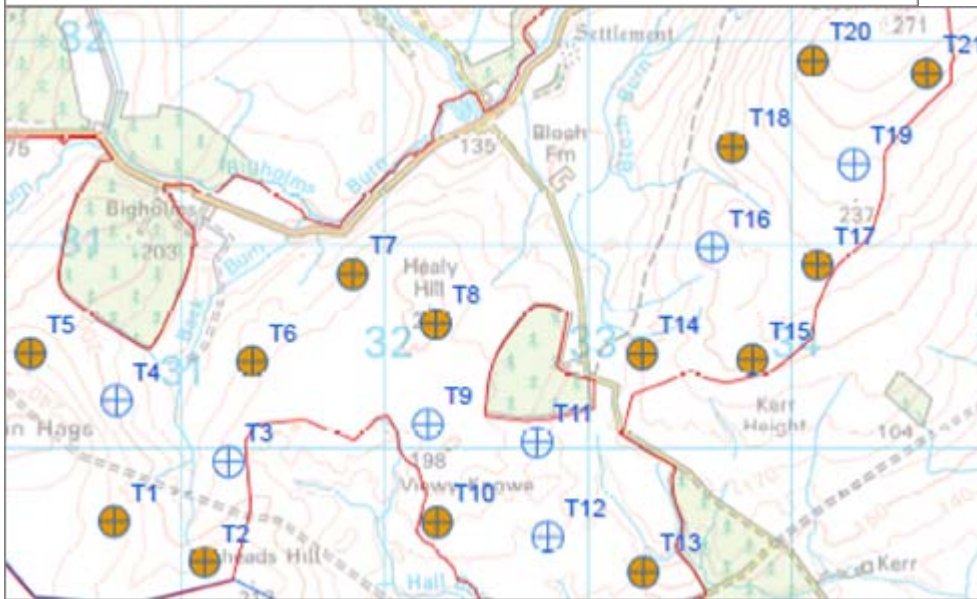
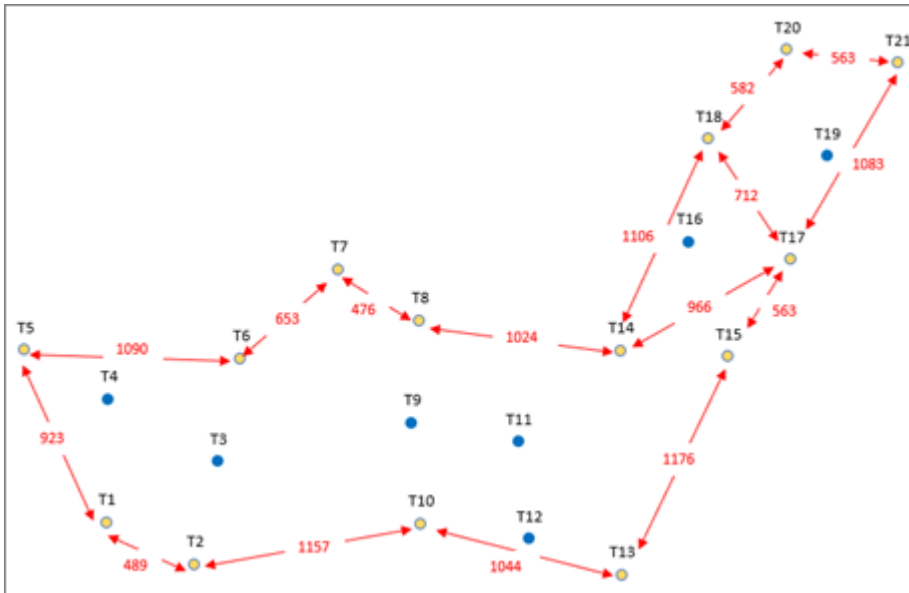
**2. Relative amsl turbine tip heights of Bloch and the nearby Solwaybank Wind Farm**

The ground levels of many Solwaybank turbines are actually higher than at Bloch and, which means that some of the turbines in each site have similar altitudes to tip.



### 3. Distance between turbines at Bloch

An examination was made of the relative altitudes of the Bloch tip heights and the distances between them. Ideally, perimeter turbines should be lit in a way such that there is no greater separation between turbines than 900 m, however, the layout at Bloch is such that some turbines have a larger than 900 m separation so it is not possible to adhere to this fully. Wherever possible, turbines have been placed such that either at least one turbine is less than 900 m or the distance has been kept as close to 900 m as possible. Bloch is in an area of relatively low operational significance from a civil aviation perspective with the closest airport, Carlisle, some @ 24 km from the site. The scheme suggested, I hope, provides a fair balance between impact on visual amenity and aviation safety.



#### 4. Proposed lighting scheme

RES therefore proposes a request to vary the lighting requirements specified in Air Navigation Order (ANO) Article 222 for the Bloch Wind Farm, under provisions given in the ANO Article 222 section 6, as per the following:

- medium intensity steady red (2000 candela) lights on the nacelles of turbines T1, T2, T5, T6, T7, T8, T10, T13, T14, T15, T17, T18, T20 and T21 (fourteen turbines in total);
- a second 2000 candela light on the nacelles of the above turbines to act as alternates in the event of a failure of the main light;
- the lights on these turbines to be capable of being dimmed to 10% of peak intensity when the visibility as measured at the wind farm exceeds 5km;
- no intermediate level 32 candela lights to be fitted on the turbine towers\*

\*The MOD will be consulted with respect to agreeing a scheme of infrared lighting.

Best regards,

**Sam Johnson**  
Senior Aviation Manager

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