Springwell Solar Farm

Environmental Statement Appendix 12.3 - Operational Equipment Details

Volume 3

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1. Operational equipment details

1.1. Introduction

1.1.1. The main noise sources from the Proposed Development are central inverters, string inverters, Inverter, Transformer, Stations (ITS) transformers, Battery Energy Storage System (BESS) containers, and transformers.

1.2. Balance of Solar System (BoSS)

1.2.1. The fields with BoSS equipment have been modelled with either a containerised unit which contained both central inverters and ITS transformers, or string inverters located around the field with ITS transformers.

1.2.2. Within the noise model the containerised central inverter and ITS transformer were modelled as a small 'industrial building' (term used within the software) with two areas sources with the octave sound power data below to achieve 57 dBA at 10m from the middle of the containers' longest face.

Table 1 Containerised central inverter and ITS transformer sound power levels

Sound Power Level, dBA	63Hz Sound Power Level, dBA	125Hz Sound Power Level, dBA	250Hz Sound Power Level, dBA	500Hz Sound Power Level, dBA	1000Hz Sound Power Level, dBA	2000Hz Sound Power Level, dBA	4000Hz Sound Power Level, dBA
86	45	67	83	75	82	74	73

1.2.3. Where fields have been modelled with string inverters and ITS transformers, string inverters were modelled as point sources of noise throughout the field with the following octave sound power data to achieve 69 dBA at 1m.

Table 2 String inverter sound power levels

Sound Power Level, dBA	63Hz Sound Power Level, dBA	125Hz Sound Power Level, dBA	250Hz Sound Power Level, dBA	500Hz Sound Power Level, dBA	1000Hz Sound Power Level, dBA	2000Hz Sound Power Level, dBA	4000Hz Sound Power Level, dBA
79	38	60	76	69	75	67	66

1.2.4. ITS Transformers were modelled as small industrial buildings in the same location where central inverters are proposed in the Engineering drawings with the following octave sound power data to achieve 54 dBA at 10m to all five faces.

Table 1 ITS Transformer sound power levels

Sound Power Level, dBA	63Hz Sound Power Level, dBA	125Hz Sound Power Level, dBA	250Hz Sound Power Level, dBA	500Hz Sound Power Level, dBA	1000Hz Sound Power Level, dBA	2000Hz Sound Power Level, dBA	4000Hz Sound Power Level, dBA
80	54	58	67	73	77	72	63

1.2.5. Comparatively, noise levels from the same field which contained string inverters and ITS transformers is louder than if containerised central inverters and ITS transformer is used. This has resulted in only a select number of fields being suitable for either central or string inverter options, rather than just central inverters.

1.3. Springwell Substation and Satellite Collector Compounds

1.3.1. The Springwell substation and satellite collector compounds used the same noise sources within the model, as it is considered that their usage is similar in terms of stepping up the voltage from their connected equipment. These were also modelled as industrial buildings with the following octave sound power data to achieve 75 dBA at 1m to all five faces.

Table 4 Springwell substation and Satellite Collector Compounds sound power levels

Sound Power Level, dBA	63Hz Sound Power Level, dBA	125Hz Sound Power Level, dBA	250Hz Sound Power Level, dBA	500Hz Sound Power Level, dBA	1000Hz Sound Power Level, dBA	2000Hz Sound Power Level, dBA	4000Hz Sound Power Level, dBA
Sides, 90	50	71	87	80	85	77	77
Top, 94	54	75	91	84	89	81	81

1.4. BESS

1.4.1. The sources of noise assessed from this area were the BESS containers and BESS transformers.

1.4.2. The BESS containers were modelled as industrial buildings with two areas sources on one of the units long and short sides with the octave sound power data below to achieve 65 dBA at 1m from source face.

Table 5 BESS Container sound power levels

Sound Power Level, dBA	63Hz Sound Power Level, dBA	125Hz Sound Power Level, dBA	250Hz Sound Power Level, dBA	500Hz Sound Power Level, dBA	1000Hz Sound Power Level, dBA	2000Hz Sound Power Level, dBA	4000Hz Sound Power Level, dBA
Long side, 76	49	50	63	69	73	68	68
Short side, 73	47	48	60	66	70	65	66

1.4.3. The BESS transformers were modelled as industrial buildings with two areas sources on one of the units long and short sides with the octave sound power data below to achieve 65dBA at 1m from source face.

Table 6 BESS Transformer sound power levels

Sound Power Level, dBA	63Hz Sound Power Level, dBA	125Hz Sound Power Level, dBA	250Hz Sound Power Level, dBA	500Hz Sound Power Level, dBA	1000Hz Sound Power Level, dBA	2000Hz Sound Power Level, dBA	4000Hz Sound Power Level, dBA
Left side, 71	44	45	57	63	68	63	63
Front side, 67	40	41	53	59	63	58	59
Right side, 50	23	24	36	42	47	42	42
Back side, 79	52	53	65	71	76	71	71
Top, 74	47	48	60	66	71	66	66

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