1 Linnet Court
Cawledge Business Park
Alnwick
Northumberland
NE66 2GD

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F.A.O. NCC Environmental Health Officer

Biomass at Yearle House – Proposal

Following concerns raised by the Northumberland County Council Environmental Protection Team, Public Health Protection Unit (PHPU), we have provided the details below, and attached documents, which we hope will address the EHO's concerns.

The boiler is an ETA PC80 boiler. Technical specifications can be found in the attached PC60-105 Installation manual PDF on page 19.

Noise

The installation manual states the noise created by the boiler in normal operation (section 7.7, page 24), which is 40-50dB (equivalent to between a computer and a fridge), with occasional peaks of 75dB to when the suction turbine runs, which is equivalent to a vacuum cleaner, which is exactly what it is, a vacuum motor pulling pellets from the store to the day hopper on the boiler.

The day hopper has a capacity of 118kg, and the boiler controls can be set to fill this up to twice a day and at any time, so, for example, it could be set for noon, when the world is at its busiest and the ambient noise at its highest as a means of mitigating the impact of the vacuum motor.

Filling the hopper takes about 15 minutes, and as the fuel is pellets (homogenous and behaves like a liquid) and is sucked rather than augered to the boiler, the short length of auger fuel feed system which pulls the pellets to the suction take-off point makes noise which is barely discernible when running without the turbine, and so is completely inaudible over the sound of the turbine. The two only ever run together.

The hopper contains the equivalent of 578kWh of fuel, so, allowing for 10% combustion losses, the boiler could run flat out for 7 hours a day on a full hopper. The reality is that this would only happen in the depths of winter and with full occupancy, and based on our earlier assumptions around heat use in Yearle House, the total annual demand will be IRO 180,000kWh. This means the hopper will need to be refilled 342 times in a year to provide this heat, so the turbine will run slightly less than once a day on average and will sound like a vacuum cleaner when it does. It's important to note that the turbine inside the body of the boiler, which is thermally insulated, and so is muffled compared to a domestic vacuum (i.e., it'll be a bit quieter).

More information from the manufacturer is also attached (Schallemission eHack-e-PE-K_EN). Hopefully this information will be sufficient to satisfy the PHPU concerns.

Air Quality

The appliance is not covered by WID and is <20MWth in size; The appliance is >50kWth; The appliance has a fuel feed rate of <45.4kg/hour of fuel (which is about equivalent to 180kW in a biomass boiler); and the flue height is determined by the manufacturer, while we have followed using the Building Regulations requirements, with regard to distances from opening windows and suchlike.

The basis of the flue height is based on the table below, which is reproduced from the installation instructions at page 17 of the attached document. The flue is 6m above the boiler room floor and has an internal diameter of 180mm, with a 45o inlet branch from the appliance to the rising flue which will enable the flue to provide the required draught of 5Pa.

Diameter of the flue pipe from boiler to chimney	Chimney height above the boiler room floor	Required chimney diameter in cm			
		PC 60	PC 70	PC 80	PC 100 PC 105
DN 150 DN 180	6 m	X 18 [a]	X 20 [a]	X 20 [a]	X 25 [a]
DN 150 DN 180	7 m	18 [a] 18	X 18 [a]	X 18 [a]	X 20 [a]
DN 150 DN 180	8 m	18 [a] 18	22 [a] 18	X 18 [a]	X 20 [a]
DN 150 DN 180	9 m	18 18	20 18	X 18	X 20
DN 150 DN 180	10 m	16 X	18 18	X 18	X 20
DN 150 DN 180	11 m	16 X	18 X	18 [a] 18	X 20
DN 150 DN 180	12 m	16 (15) X	18 X	18 18	X 18
DN 150 DN 180	13 m	16 (15) X	18 (16) X	18 18	X 18
DN 150 DN 180	14 m	16 (15) X	18 (16) X	18 X	X 18

a. For boiler outputs over 30 kW and low chimney heights, a chimney joint tilted 45° can help achieve the required draught of 5 Pa at full load with acceptable cross-sections (a size smaller than indicated in the table).

We have also supplied the RHI Emissions Certificate for ETA PC80 boiler, showing that the appliance is below the particulate matter (PM) and NOx limits set for accessing the RHI scheme. These limits are 30 g/GJ for particulates and 150g/GJ for NOx. The PC80 boiler has measured particulate emissions of 7g/GJ for PM and 70g/GJ for NOx, so is a significantly below on both.

The ETA PC80 Smoke Control Area exemption (downloaded from the Smoke Control Area website) is also provided for further information and shows this is a permitted appliance.