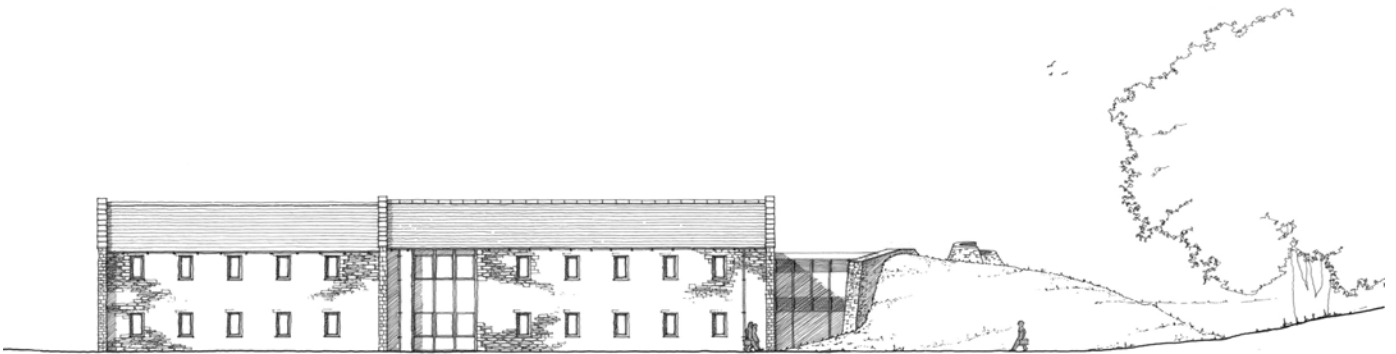




**YORKSHIRE DALES**  
National Park Authority

## **Ground Source heat pump system for new offices in Bainbridge, Wensleydale**

In January 2006, staff from the Yorkshire Dales National Park Authority moved into a new office 'Yoredale', in the village of Bainbridge in Wensleydale. The purpose-built office, which covers 11,000sq ft, provides new, comfortable, accessible accommodation for up to 63 staff, the community and other visitors. It incorporates several environmentally friendly features into its design. The building, where possible, uses traditional locally-produced materials from sustainable sources like locally-quarried stone, and the meeting rooms are built into a grass bank with a grass roof to reduce the impact of the building and act as natural insulation.



The installation of ground source heat pumps to provide underfloor heating to the building was an important element of the design to promote sustainable technology within the National Park. There is no piped natural gas in the area, therefore a ground source heat pump offered a viable alternative to oil/LPG or direct electric options that are currently in use in the area. The Authority, as the largest community organisation based in the Yorkshire Dales, is well placed to show this technology working in practice to the local community. The ground water heating system is able to provide all the heating requirements without the need for additional heating plant, it is the only source of heating and an integral part of the heating system.



**Yoredale from the front**

## Details of the Ground Source heat pump system

- A total 8 bore holes, each 105 m deep. Six are in front of the main two storey building in the grassed areas. The other two are under the access track near the field gate.
- Circulating fluid (water/anti freeze) flows into each pipe which then absorbs the heat from the ground and returns to the heat pump at a higher temperature. The heat pump can then upgrade this heat to a high enough temperature to provide underfloor heating.
- There are three Ground Source Heat Pump systems, one for the underground rooms and reception, the others for the two storey office.
- The system for the underground rooms and reception uses the bore two holes under the access track. The two return pipes from the bore holes go to a chamber on the grass roof and then into one pipe that goes to the heat pump. The heat pump is located in a small service room next to the resource centre.
- The system for the two storey office uses the six bore holes in front of the building. Pipes from the these bore holes go to two manhole chambers in the grassed area at the front then two larger pipes go from these chambers, round the building and into a service cupboard under the stairs, to the two heat pumps for this system.
- The underfloor heating is provided by heated water within plastic pipes within the floor screed. There are a number of different zones within the building meaning the temperature in differing areas of the building can be changed.

