

Holymoor Consultancy has been operated since 1998 by David Banks, an internationally experienced Chartered Geologist. David is the author of two widely-read textbooks, published by Wiley: “*Water Wells and Boreholes*” and “*An Introduction to Thermogeology: Ground Source Heating and Cooling*”. The business was incorporated as a Limited Company in England and Wales in 2008.

Holymoor Consultancy Ltd. offers a wide variety of tailored consultancy services in the fields of

- **thermogeology:** feasibility and design of **ground source heating and cooling systems**.
- **hydrogeology:** **water well** prognoses and feasibility studies; groundwater resources assessments.
- **environmental geochemistry:** groundwater **quality assessment**, contamination, mine water chemistry.

Holymoor Consultancy Ltd. also offers a range of competitively-priced standard services for the ground source heating and cooling industry.

Thermogeological Baseline Review

If you are considering installing a ground source heating / cooling system and you need to gain knowledge about the suitability of the site geology, or if you are unsure whether a horizontal closed-loop, a borehole closed-loop or a groundwater-based open loop is the system for you, you should request a **Thermogeological Baseline Review**.



Holymoor’s affordable TBR report can be used by heat pump installers, drillers, engineering consultants or private clients in the initial stages of a ground source heating/cooling project. It provides:

- a review of the geology, topography and drainage at the site
- an assessment of the site hydrogeology and likely availability of groundwater
- a review of the water wells in proximity to the site, including relevant drilling logs
- recommended values of thermal conductivity, heat capacity and subsurface temperature of the rocks, for use in subsequent design.
- an evaluation of horizontal and vertical closed loop options and groundwater-based open loop options, with approximate sizings of required borehole / trench lengths
- identification of key risks, geohazards and Environment Agency requirements
- recommendations for the next steps
- *in coal mining areas, an assessment of the influence of coal mining activities*

Report (single site only)	Product Codes (standard prices apply)
Thermogeological baseline review	TBR1
Thermogeological baseline review (with mining assessment)	TBR1M

Domestic System: Combined Feasibility and Design

If you already know that you require a closed loop ground source heating system, Holymoor can provide you with a combined thermogeological review and design simulation, using industry-standard software. The combined report will describe the geology at your site and will identify any likely geohazards. It will also give you an accurate sizing of your borehole or trench heat exchanger (provided, of course, that you are able to tell us what you want your system to achieve - i.e. what heating loads it will support and what heat pump you prefer).

Report (single site only)	Product Codes (standard prices apply)
Site meeting with client	DSRSM
Combined thermogeological baseline review (TBR) and design simulation for small (< 16 kW peak load) schemes	DSR16TBR1
As above, with mining assessment	DSR16TBR1M

Design Simulation Reports - Commercial

Having reviewed the geology of the site and decided on a closed-loop ground source heating / cooling option, Holymoor Consultancy Ltd. is able to use industry-standard software to design your ground loop heat exchanger. We will use either of the following tools, as appropriate, taking into account site-specific geological conditions.

- the Swedish software **Earth Energy Designer (EED)** version 3, or
- **Ground Loop Design (GLD)** (commercial version) by Gaia Geothermal

We will design your ground heat exchanger in order to meet specific, user-defined fluid temperature criteria:

- taking account of site-specific geological factors
- for a specific (or generic) heat pump
- using peak and monthly/daily heating and cooling loads provided by you, the client, or by your HVAC consultant
- using a conservative approach employing *best estimate* and *reasonable worst case* geological scenarios
- including an assessment of the hydraulic performance of the ground loop



Design Simulation usually presupposes that a thermogeological review has already been carried out. As an option, the Design Simulation report can be combined with a **Thermogeological Baseline Review (TBR)**. Design Simulations are typically priced according to the peak heating or cooling load of the scheme.

Design Simulation Report (per system)	Product Codes (standard prices apply)
Site meeting with client	DSRSM
Combined thermogeological baseline review (TBR) and design simulation for small (< 16 kW peak load) schemes	DSR16TBR
Design Simulation (only) for small (<16 kW peak load) schemes	DSR16
Design Simulation Report: 16-50 kW peak load	DSR50
Design Simulation Report: 50-100 kW peak load	DSR100
Design Simulation Report: 100-200 kW peak load	DSR200
Design Simulation Report: >200 kW peak load	Price on application

Thermal Response Test Analysis



Holymoor Consultancy Ltd. carries out analyses of thermal response tests for four of the UK's leading providers of such tests. Holymoor carries out comprehensive individual (not automated) analyses of heating and recovery tests and has the capability to analyse certain types of non-standard test. The output from test analysis includes the following:

- consideration of geology and borehole construction
- evaluation of test quality in accordance with IGSHPA and IEA guidance
- calculation of ground average thermal conductivity and undisturbed temperature
- calculation of borehole thermal resistance under test conditions
- analysis of confidence in test result.

Report (single site only)	Product Codes (standard prices apply)
Thermal response test analysis (standard)	TRT1
Thermal response test analysis (non-standard)	Price on application

Holymoor began its life as a **hydrogeological** consultancy. So, if you are considering a groundwater-based open loop heating or cooling scheme, we are ideally placed to assist you with:

- groundwater yield and water well prognoses,
- analytical modelling (using peer-reviewed methodologies, also provided to the Environment Agency for their internal assessment purposes) of heat migration and thermal breakthrough
- assessment of water quality and hydrochemical modelling

Call Dave Banks on 01246-230068 to discuss your needs for geo-design of ground source energy systems.