

Earth Energy
accessible
reliable
renewable

HEAT PUMPS



The Manuka Point Lodge.

Alpine Hunting Lodge Keeps Guests Warm with Earth's Energy

Located deep in the Rakaia Valley, one hour west of Methven in Canterbury, Manuka Point Lodge experiences some of the most extreme climatic conditions in New Zealand.

Winter temperatures can drop as low as -15°C , say owner/operators Don and Julie Patterson. The Pattersons built the lodge in 2008 and officially opened it to guests in February the following year.

"We set out to create a premium trophy hunting lodge that was as sensitive to the environment as it was to the needs of our clients," says Don.

"A big part of this is ensuring that clients are warm and comfortable in an otherwise unforgiving environment. This means economically and effectively heating every room in the lodge."

Given the alpine location this took some careful planning.

"At the time, ground source heat pump technology was still relatively unproven in New Zealand, so it was a bit of a leap of faith for us to choose this system of heating over more conventional options."

KEY BENEFITS:

- Effective and economic heating in an extreme environment
- All rooms are heated evenly
- No emissions, low noise, environmentally sensitive
- Point of difference to promote the business

KEY FEATURES:

- System installed in 2008
- Dual Fluid Tandem 20 (19.9 kW) supplying warm water of $30\text{-}35^{\circ}\text{C}$ to under floor heating pipes covering 381 m^2
- Heated Area: 381 m^2
- Horizontal Captor Area: 510 m^2



The captor field being installed.

“ITS SUPERB. IT IS EVERY BIT AS GOOD AS I HAD IMAGINED. WE MADE THE RIGHT DECISION - AND IF IT WORKS HERE, IT WILL WORK ANYWHERE.”



The under floor heating circuits.



The lodge is warm and comfortable thanks to ground source heating.

The system was designed and installed by Next Energy. The Pattersons chose ground source heating for a number of reasons.

“While limited information was available in New Zealand at that time, I knew the technology was popular in Europe and worked well in extreme climates. I also understood how it worked and was confident that it would meet our needs. We also liked the fact it was completely emission free - the air up here is clean and we want to keep it that way. We didn’t want to rely on fires or boilers for our heating.”

Internally, the lodge is heated by a fairly conventional underfloor system consisting of warm water circulated through pipes laid in the concrete foundations; 26 separate “circuits” have been laid allowing for different temperatures to be maintained in different parts of the lodge.

More unique, is that the warm water is supplied by a ground source heat pump.

Ground source heat pumps work by extracting low levels of heat from the ground. Ground at a few meters below the surface remains at a relatively constant temperature year round and when accessed by a ground source heat pump this heat can be used to supply water of 30–35°C.

The direct exchange geothermal system has three major components.

The ‘captor field’ is essentially a network of pipes laid in a horizontal grid and buried. As a refrigerant is circulated through this ground loop, it absorbs heat from the ground and changes into a vapour form.

In the heat pump, the vapour enters the compressor where its pressure is raised, increasing the vapour temperature. Heat is transferred from the vapour to the building’s heating system. The vapour condenses back to a liquid which is recirculated through the earth loop.

Inside the lodge, the warmed water flows through pipes, releasing heat and warming the building.

The system has been a resounding success for Manuka Point Lodge.

“Its superb. It is every bit as good as I had imagined. We made the right decision - and if it works here, it will work anywhere,” says Don.

It has also proved a point of interest for guests staying at the lodge, who regularly quiz Don and Julie on the specifics of ground source heating.

MANUKA POINT LODGE
SOUTH ISLAND NEW ZEALAND

Don & Julie Patterson
Owners

Manuka Point Lodge

R.D Methven 7791
South Island
New Zealand

Phone: +64 (0)3 318 5878

Email: don@manukapoint.com

Website: www.manukapoint.com

New Zealand requires reliable, renewable energy sources into the future. The Government is supporting GNS Science in fostering increased use of renewable resources. By 2025, the Government’s Energy Strategy aims for direct use of geothermal energy to account for more than 12 PJ/year.

For more information visit our website:

www.gns.cri.nz/earthenergy

or contact us:

Wairakei Research Centre

114 Karetoto Road,
Wairakei 3377
Private Bag 2000,
Taupo 3352
New Zealand
Phone: +64 7 374 8211
Email: earthenergy@gns.cri.nz

