

Geothermal guideline 2

Keeping your geothermal well fit for purpose and safe



Using the geothermal resource

There are several geothermal systems in the Bay of Plenty region, including the Rotorua Geothermal System.

In Rotorua this resource is used for bathing, domestic and commercial space heating, wellness services and traditional cultural practices. Some of these uses require geothermal wells to extract the geothermal water and/or heat. There are about 130 resource consents for using geothermal energy in Rotorua (and about 300 operating wells). There are also many abandoned or decommissioned wells.

Can anyone use geothermal energy?

Under the Resource Management Act 1991 resource consents are required from Bay of Plenty Regional Council to build a geothermal well.

A resource consent is also needed for the taking of geothermal water and/or heat from a geothermal well, and for the discharge of that water by reinjection, or to land or water.

Customary practices that do not use a geothermal well, or take water directly from the aquifer, do not need a resource consent from Bay of Plenty Regional Council.

Are there risks in using geothermal wells?

There are three types of geothermal wells that are used in Rotorua, including production wells, injection wells, and down hole heat exchangers. Any geothermal well can create health and safety risks.

Risks include uncontrolled discharge of hot water and steam, poisonous gases such as H₂S (hydrogen sulphide) and well blowouts. These can damage property and can cause serious injury or death.

Uncontrolled discharges can also have adverse effects on the health of the geothermal system.

How do I manage these risks?

Building geothermal wells to best practice standards and keeping them in good condition keeps people safe.

Correctly constructed wellheads are also needed for monitoring.

What things do I need to consider when building and maintaining my well?

Several regulations require well owners and drillers to follow best practice standards when building and maintaining geothermal wells:

- The Geothermal Regulations 1961 (administered by WorkSafe)
- Rotorua Lakes Council (RLC) Geothermal Bylaw 2016
- Rotorua City Geothermal Energy Empowering Act 1967
- Bay of Plenty Regional Council geothermal resource consents under the Resource Management Act 1991

The Health and Safety at Work Act 2015 manages risks in a place of work (e.g. contractors working on private geothermal wells or commercial premises with a well).

What are the best practice standards?

As the well owner, you are responsible for ensuring your well is built and maintained to best practice standards and for keeping records of any maintenance work undertaken.

Best practice for shallow geothermal wells (generally <150m) is outlined in WorkSafe's *Geothermal Health and Safety Guidelines for Shallow Geothermal Wells* (see www.worksafe.govt.nz).

Best practice for deep wells is outlined in the Code of Practice for Deep Geothermal Wells 2014.

What are the key elements of a safe well?

The guideline covers things like:

- A properly designed wrought cross tee
- Fit for purpose maintained steel master valves (gate valves are preferred)
- No gas or fluid leaks or excessive corrosion
- A pressure gauge (for pressurised wells)
- Visible casing and crack free grout
- Clear labelling of the well number
- Fencing (e.g. keep people safe from hot pipes and well heads)
- Access for quenching, by installation of a valve beneath the master valve
- Casing in good condition.

How do I know if my well is safe?

If you think your well may not be safe or up to best practice standards, you should get it checked by a suitably qualified person (e.g. an audit). They will check your wellhead and equipment to see if it has been safely built to best practice as in the guidelines above. Bay of Plenty Regional Council and Rotorua Lakes Council audit wells on a regular basis.

You may also have to check the condition of your casing if you have an older well. Wells over 30 years are especially at risk of failure. There are various methods for testing well casing integrity. Air cap testing is an acceptable method.

WorkSafe can also request a commercial well owner to conduct downhole surveys of their geothermal wells.

Contact Bay of Plenty Regional Council or Rotorua Lakes Council for advice about whether an audit is needed and how we can help.

Who pays for a well head or casing check or audit?

As the well owner you will have to pay for any materials or work required to maintain your well head and casing every.

You should get the condition of your well checked regularly by a suitable qualified person as part of your ongoing maintenance programme.

What happens if my well head or casing is not up to standard?

If an audit (by councils or your usual well provider) finds your well does not meet the guidelines, you will be advised on the action you need to take. You will get a copy of their report, which will explain any issues with the well. If the issues are severe, and/or life threatening, the councils and WorkSafe will require you to fix them immediately. If the issues are less severe, you will be given a reasonable timeframe to address the issues as part of your regular maintenance schedule.

Your well will need to meet best practice when you come to renew your consent (e.g. when your current resource consent expires).

A well maintenance plan and maintenance records

You need to include records of all maintenance on your well. These may be audited. You may also be required to do a well maintenance plan.

Who can I go to for help to make my well safe?

Only suitably qualified, experienced people should work on geothermal wellheads. They should be able to document their experience, have a high work standard, hold relevant qualifications and be committed to operate to best practice standards. Contact staff at the Bay of Plenty Regional Council, Rotorua Lakes Council or WorkSafe for advice if you are unsure.

What happens if I don't do the repairs required to make my well safe?

You will be given a reasonable timeframe to carry out any repairs. But we need to keep people and property safe, so if you don't make repairs within the timeframes, the councils will send you a warning. If you still don't make your well safe, enforcement action might need to be taken.

Keeping your wells fit for purpose and keeping people safe is a priority and we can provide advice to you if you need it.

Closing down or abandoning a well

There is a correct way to safely abandon geothermal wells when they are no longer in use. This requires a suitably qualified expert and is outlined in the *Health and Safety Guidelines for Shallow Geothermal Wells*.

For more information:

Bay of Plenty Regional Council
Phone 0800 884 880
www.boprc.govt.nz/geothermal

Rotorua Lakes Council
Phone 07 348 4199
www.rotorualakescouncil.nz

WorkSafe
Phone 0800 030 040
www.worksafe.govt.nz