

# Identifying significant geothermal surface features in the Bay of Plenty region

## What are significant geothermal surface features?

Geothermal surface features provide a tangible example of the amazing processes occurring underneath our feet.

Geothermal surface features include heat tolerant geothermal vegetation and habitat, hydrological features such as geysers, springs and mud pools. Together, these features make up geothermal landscapes.

These features are an increasingly rare occurrence all over the world, but are relatively abundant in parts of the Bay of Plenty. We are fortunate to have about 3,000 geothermal surface features in our region with many different feature types.

The Bay of Plenty's geothermal areas are unique and contribute to the character and quality of the region. For example, geothermal habitat is a naturally uncommon ecosystem that is critically endangered<sup>1</sup>, and has been identified by the Ministry for the Environment and the Department of Conservation as a national priority for protection<sup>2</sup>. Whakarewarewa in Rotorua also contains some of New Zealand's last remaining geysers, which are also internationally rare.

You can read more about surface features on our website [www.boprc.govt.nz/geothermal](http://www.boprc.govt.nz/geothermal)

| Geothermal surface features: Main types and associated habitats                                    |                          |                                                      |                                  |                 |                                              |
|----------------------------------------------------------------------------------------------------|--------------------------|------------------------------------------------------|----------------------------------|-----------------|----------------------------------------------|
|                                                                                                    | Primary geothermal fluid | Mixed/diluted geothermal fluid                       | Mixed diluted steam heated fluid | Steam fed       |                                              |
| Geothermally-influenced aquatic habitat                                                            | Geysers                  | Intermittent or active hydrothermal eruption craters | Mud geysers                      | Fumaroles       | Geothermal habitat on heated/acid dry ground |
|                                                                                                    | Flowing springs          | Mixed springs                                        | Ejecting mud pots                | Steaming ground |                                              |
|                                                                                                    | Non-flowing pools        | Mixed pools                                          | Mud pools                        | Heated ground   |                                              |
| ← Habitat dependent on geothermally altered atmosphere overlays all types (warm air, frost-free) → |                          |                                                      |                                  |                 |                                              |

<sup>1</sup> Holdaway RJ, Wiser SK, Williams PA (2012). A threat status assessment of New Zealand's naturally uncommon ecosystems. Conservation Biology 4: 619–629.

<sup>2</sup> Ministry for the Environment and Department of Conservation 2007. Protecting our Places - Introducing the National Priorities for Protecting Rare and Threatened Native Biodiversity on Private Land. MfE, Wellington.



Inferno crater, Waimangu

## Why do we need to protect them?

Many features are fragile and easily damaged. They can be affected by nearby extraction of water, heat and energy, as well as through direct land use activities, such as earthworks, infrastructure development and vegetation clearance.

We need to find a balance between protecting these surface features and the associated ecologies, while enabling sustainable use of the geothermal resource.

Toi Moana Bay of Plenty Regional Council has developed an approach that requires the identification of surface features that are particularly unique or rare (these are called significant geothermal features), to ensure those with important cultural, ecological, or geological values are protected through policies and rules in Regional and District Plans.

## What is Regional Council's role in the protection of surface features?

Under the Resource Management Act 1991 (RMA), Regional Council is required to sustainably manage geothermal in our region. To do this, Regional Council has developed a policy approach that accommodates both the demand for use of geothermal, and the need to protect geothermal surface features and other unique values of these areas.

We are in a process of collecting information about significant geothermal features, to help inform an upcoming plan change that will better ensure their protection.

## Why is Regional Council collecting this information?

The presence of significant geothermal features is a determining factor in how Regional Council classifies a geothermal system and, therefore, the management approach that Regional Council adopts for that system.

For example, a geothermal system with many significant geothermal features will have a high level of protection compared to one with little or no significant features where development and use is more appropriate.

*Geyser*



*Ejecting mud pot*



*Acid dry ground sulphur deposit*



## How is the significance of a surface feature determined?

The Bay of Plenty Regional Policy Statement (RPS) sets the overall framework for how this is done. This includes a requirement for the identification of significant geothermal features using consistent criteria.

A specific criteria set was developed and included within the Regional Policy Statement ([Appendix F set 7](#)) to reflect the unique context and spatial distribution of geothermal features. The set includes separate criteria for geothermal geological features, and for geothermal vegetation or habitat of indigenous fauna. Māori culture and traditions are also provided for as part of the criteria in the Regional Policy Statement ([Set 4](#)).

## Who can carry out the criteria assessment?

Ecological and geological criteria assessments must be carried out by suitably qualified geothermal experts using the criteria included in the Regional Policy Statement.

Cultural criteria assessments can only be undertaken by pūkenga, kuia and/or kaumātua.

## When and how will this be done?

Regional Council has contracted experts to carry out identification of possible significant geothermal features across the region using the criteria in the Regional Policy Statement. This initial assessment has been done as a 'desktop exercise', using aerial photography for geothermal vegetation, historical published reports and data for geological features. In some instances where there is uncertainty, in-person assessments on the ground will be necessary to confirm whether these features still exist and their significance.

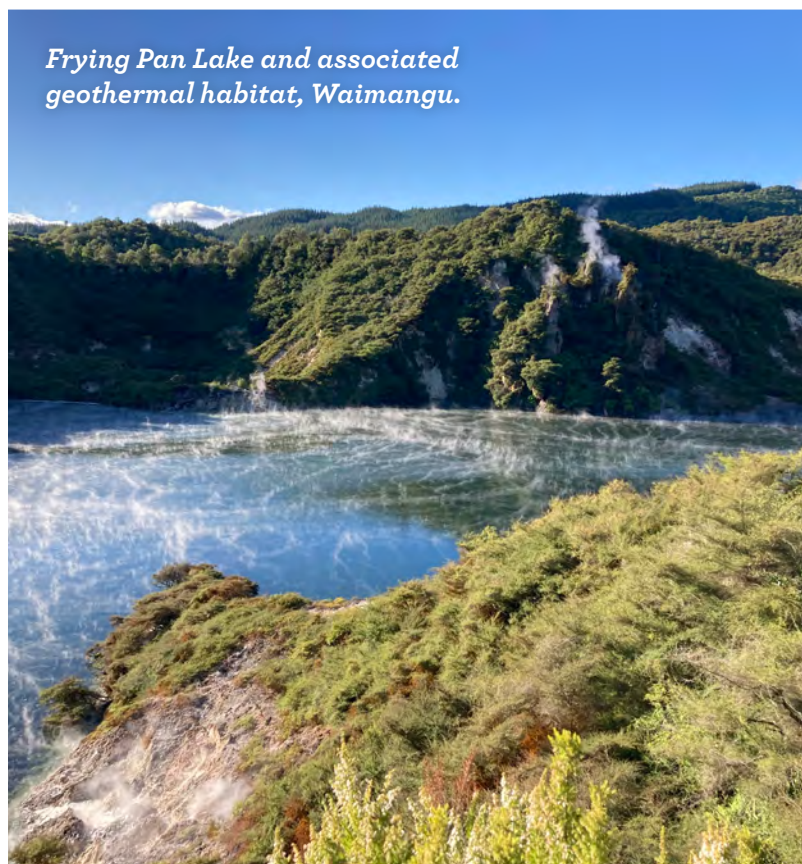
Cultural criteria assessments have not been undertaken as it is often not appropriate for Regional Council to hold or share this information. Cultural assessments need to be done on a case-by-case basis by the relevant pūkenga, kuia and/or kaumātua of an area. This would likely happen when a consent application is lodged to undertake an activity near a feature(s), as part of a wider cultural impact assessment.



*Flowing spring*



*Mixed pool*



*Frying Pan Lake and associated geothermal habitat, Waimangu.*

## How will you know if features on your property are significant?

If you have a surface feature or features on your property that have been assessed as being significant, you will be advised by Regional Council.

There is an opportunity to have these features assessed on the ground, if this has not already occurred. You can also discuss the assessment findings if you feel a feature has been incorrectly assessed, or you would like more information on its values.

## What does it mean if you have significant geothermal features on your property?

Many surface features are found in areas with high ecological or landscape values. Therefore, most may be within areas already identified in district plan maps as outstanding natural features and landscapes, or Significant Natural Areas, and are afforded a level of protection through that.

However, once criteria assessments have been completed and confirmed, a scheduled list of all significant geothermal features will be included in the Bay of Plenty Regional Natural Resources Plan through a regional plan change (this is underway).

The Regional Natural Resources Plan will also contain policies and rules that relate to extraction of water, heat and energy, or land use activities undertaken near these features. This will most likely be in the form of minimum setback distances, depending on the activity to be undertaken.

Any policies and rules developed will be publicly released as a draft with opportunities for feedback and changes to be requested as part of this process.



*Prostrate kanuka*  
(*Kunzea ericoides* var. *microflora*)

## What if you disagree with the assessment?

After an in-person assessment on your site, and if you disagree with the assessment, you can dispute the assessment. At such time, you may choose to engage your own suitably qualified geothermal expert to undertake an assessment using the Regional Policy Statement ([Appendix F set 7](#)) and provide this to Regional Council for consideration.



*Non-flowing pool and geothermally influenced habitat*

For more information visit **[boprc.govt.nz/geothermal](https://boprc.govt.nz/geothermal)**