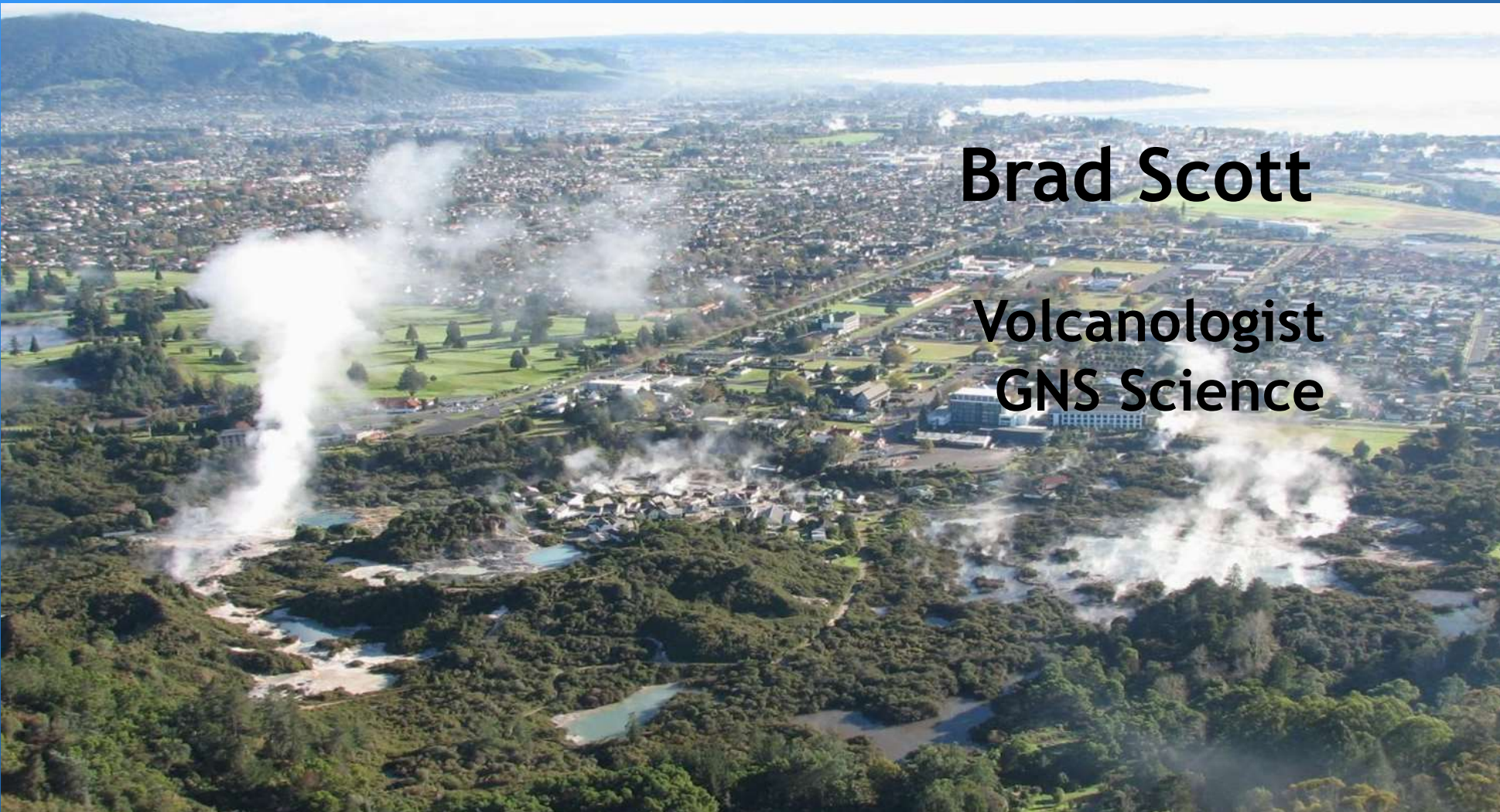




Sustainable Communities
Sharing Knowledge

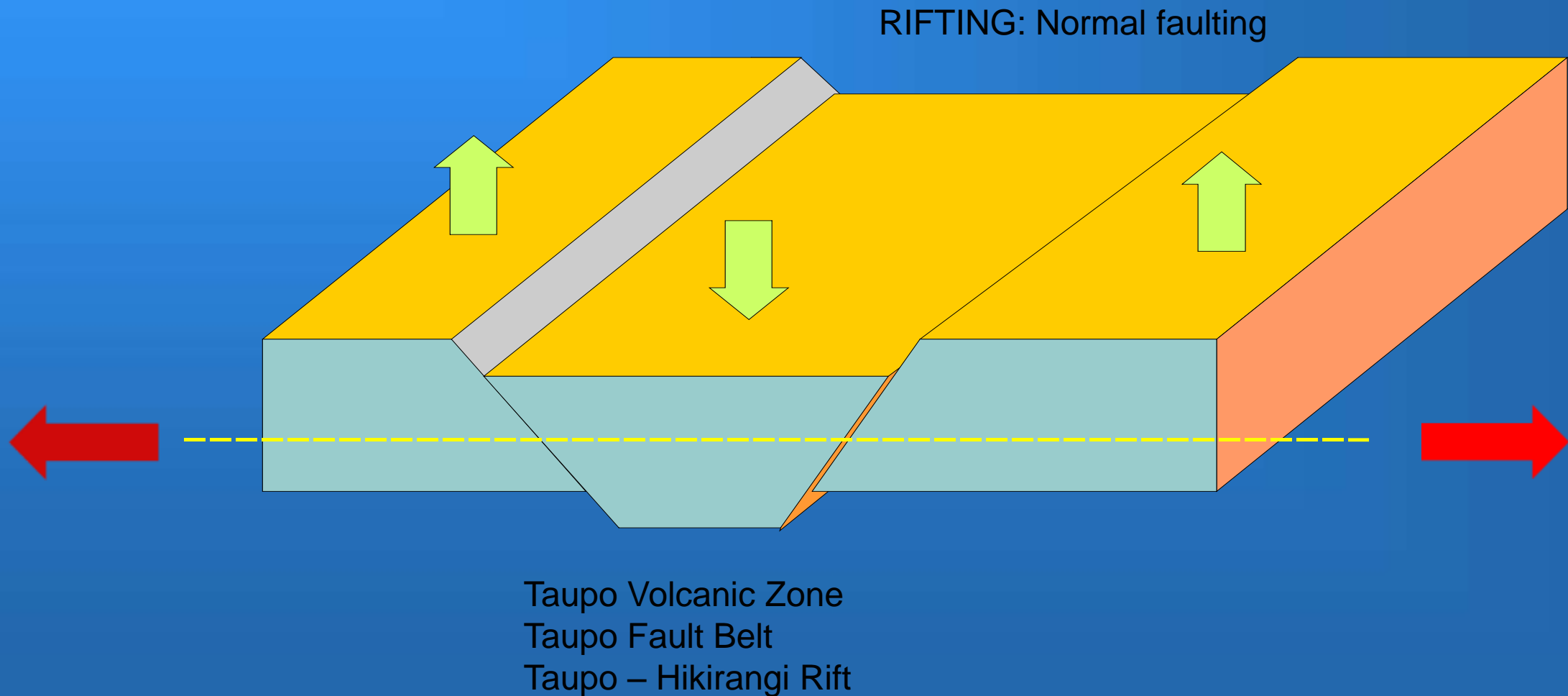
Rotorua City, life in a geothermal system



Brad Scott

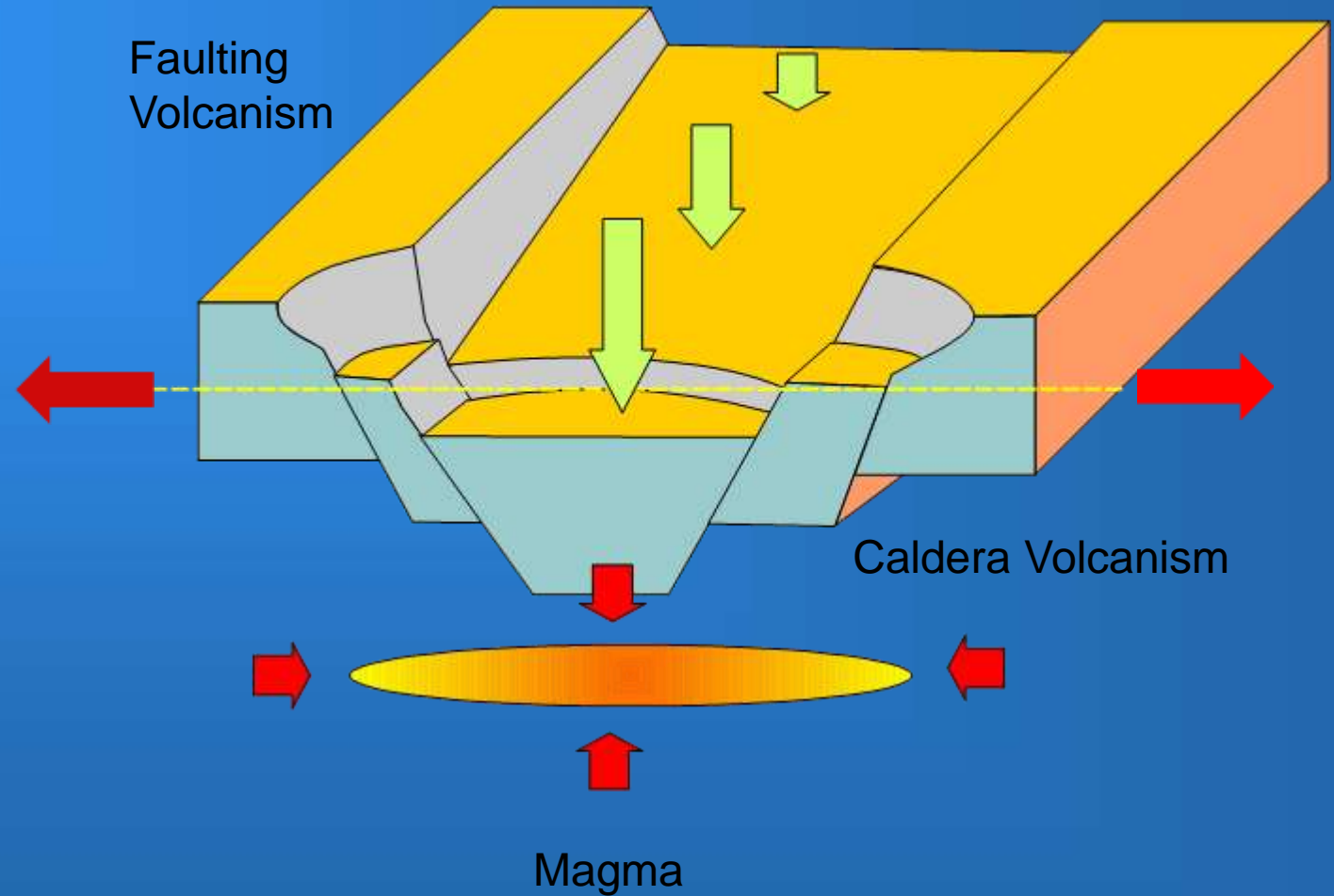
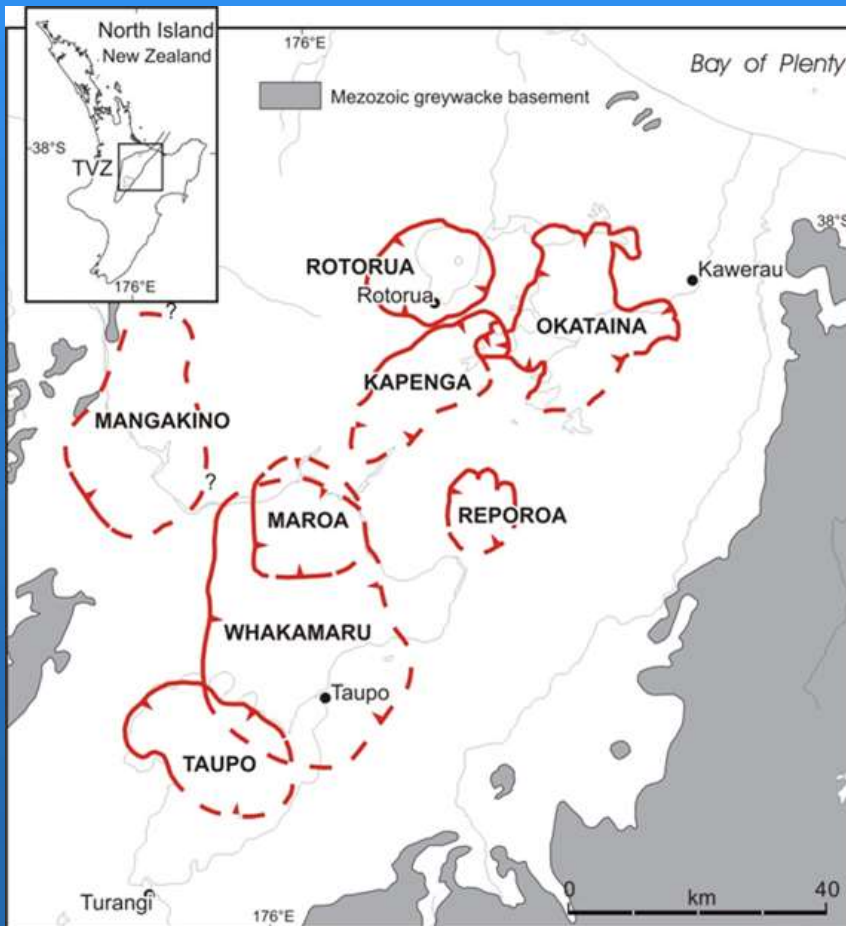
**Volcanologist
GNS Science**

Whakatane-Rotorua-Taupo-Tongariro; Geology Model



Rotorua City, life in a geothermal system

Volcano-Tectonic model



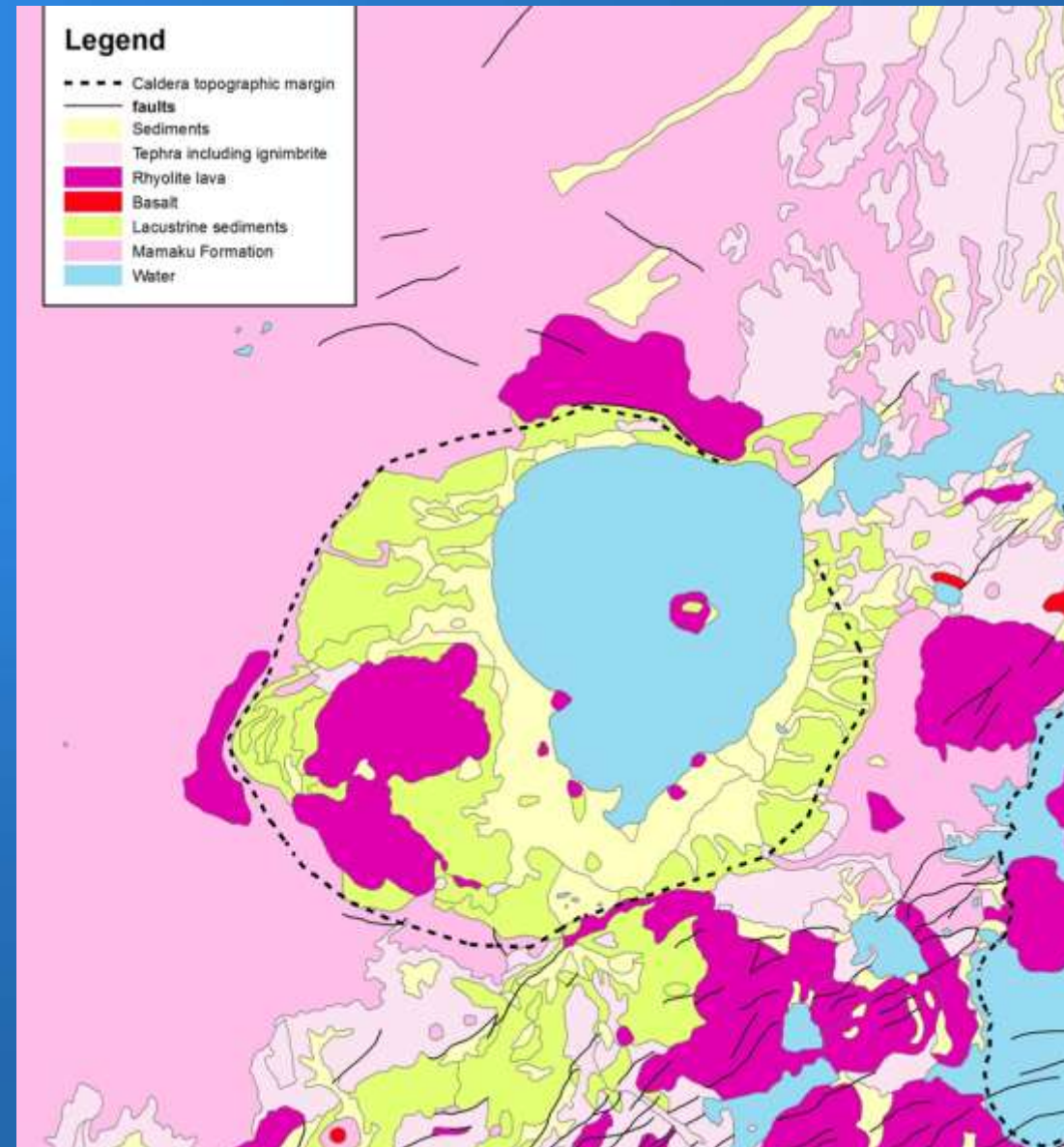
Rotorua Geology

Large basin; surrounded by thick eruption deposit

Lava domes

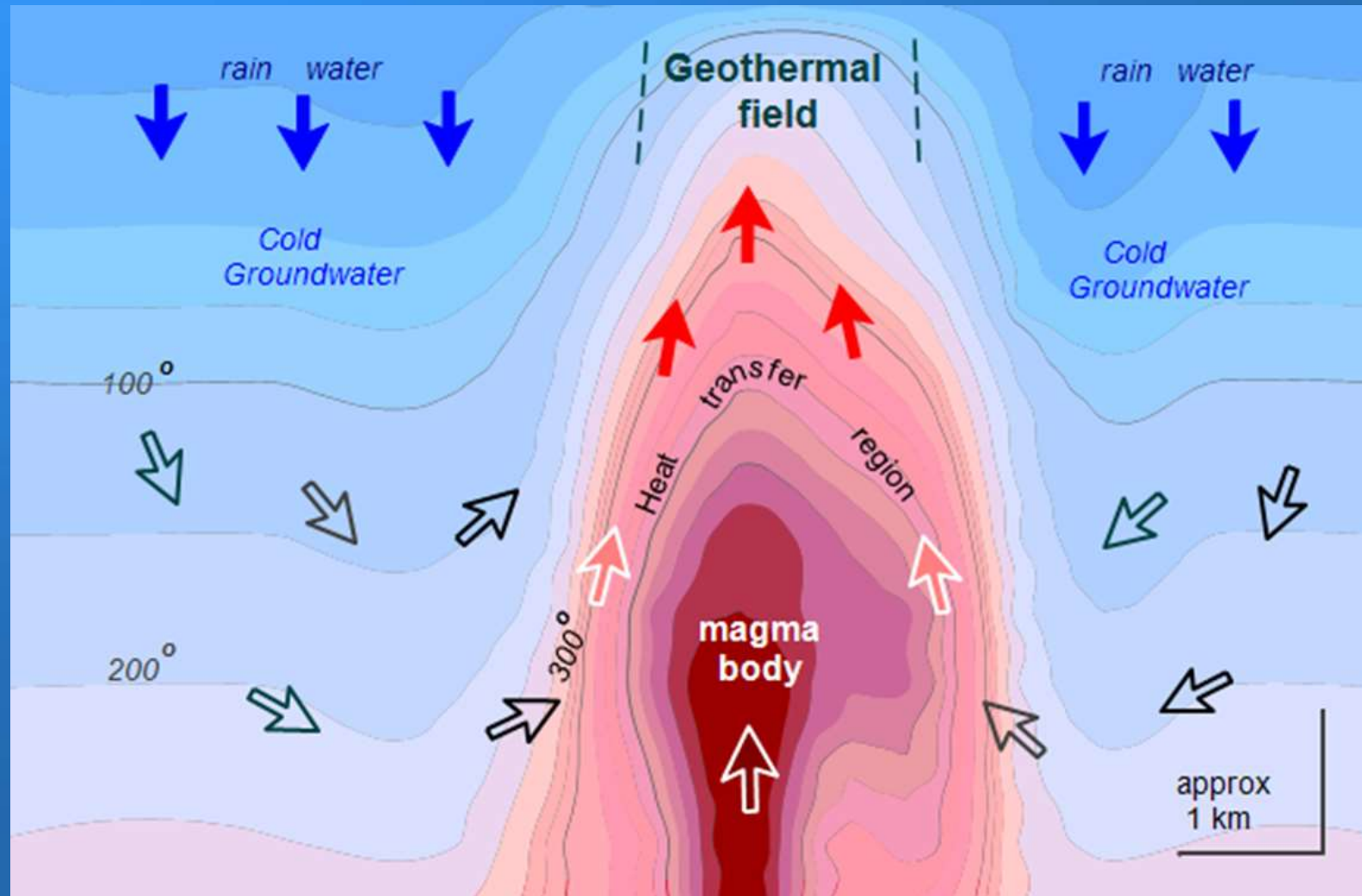
Thick sediments; variable properties

Complex rift and faulting to East and South

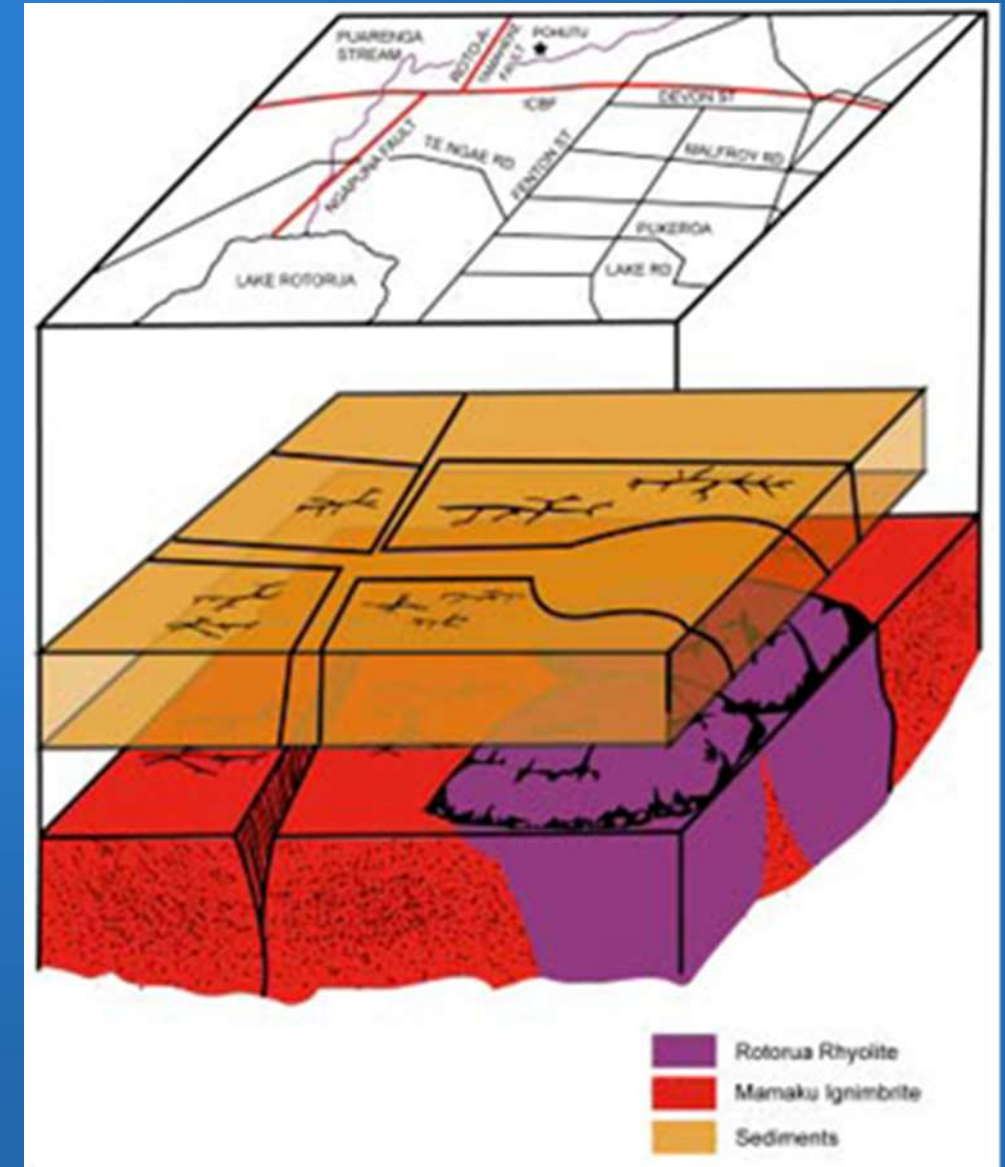


Rotorua City, life in a geothermal system

What is a geothermal system

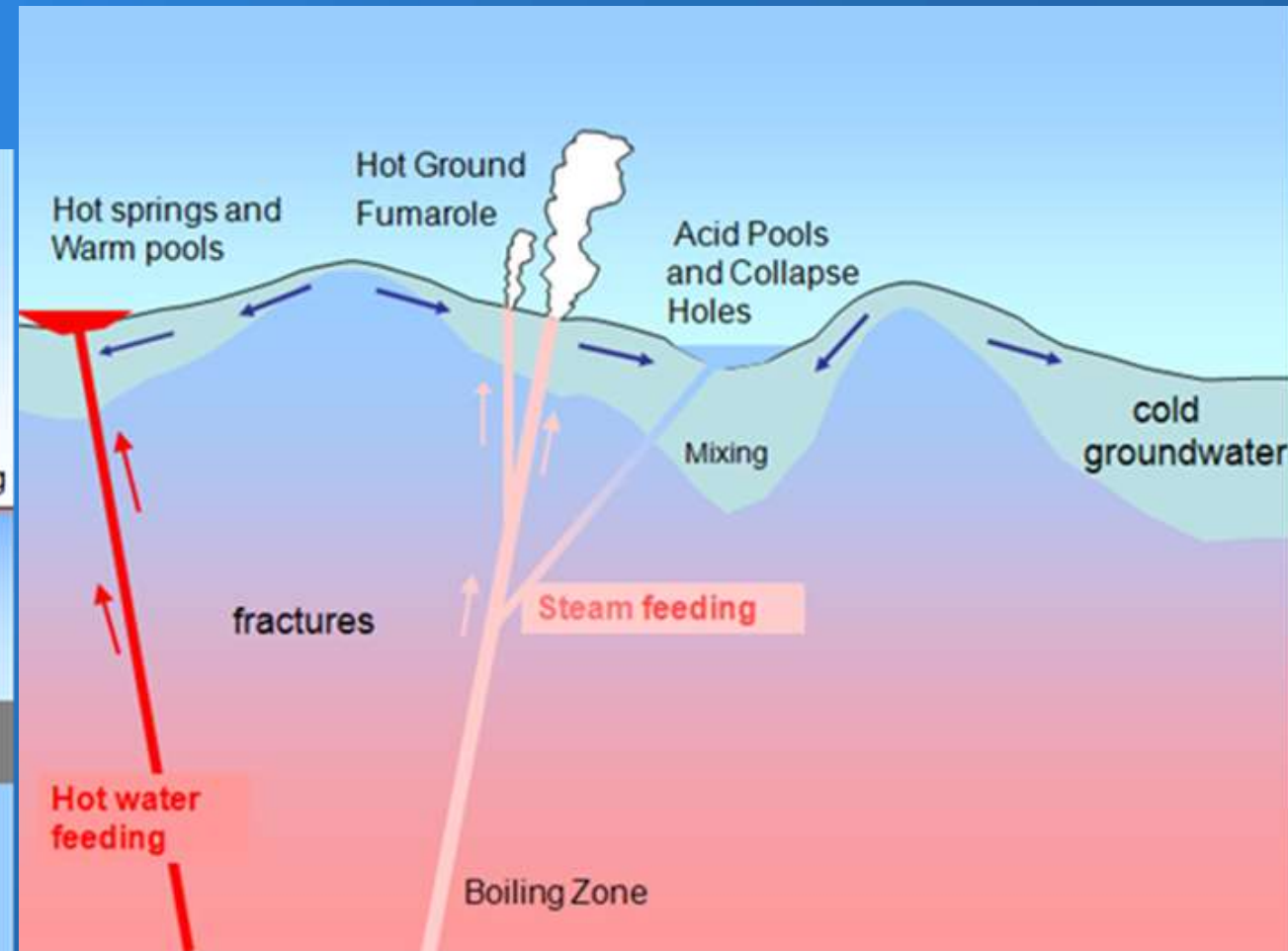
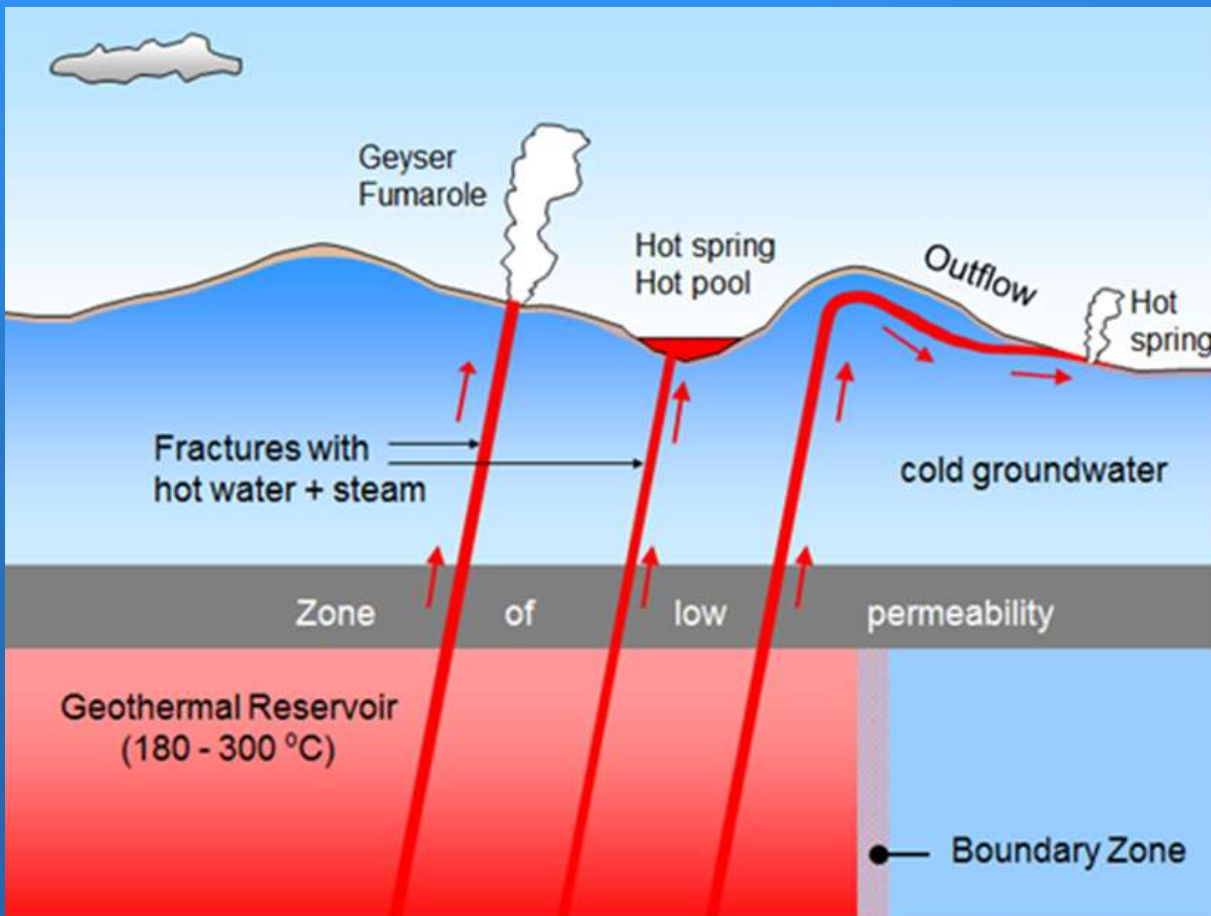


Rotorua Geothermal System (City Geology)



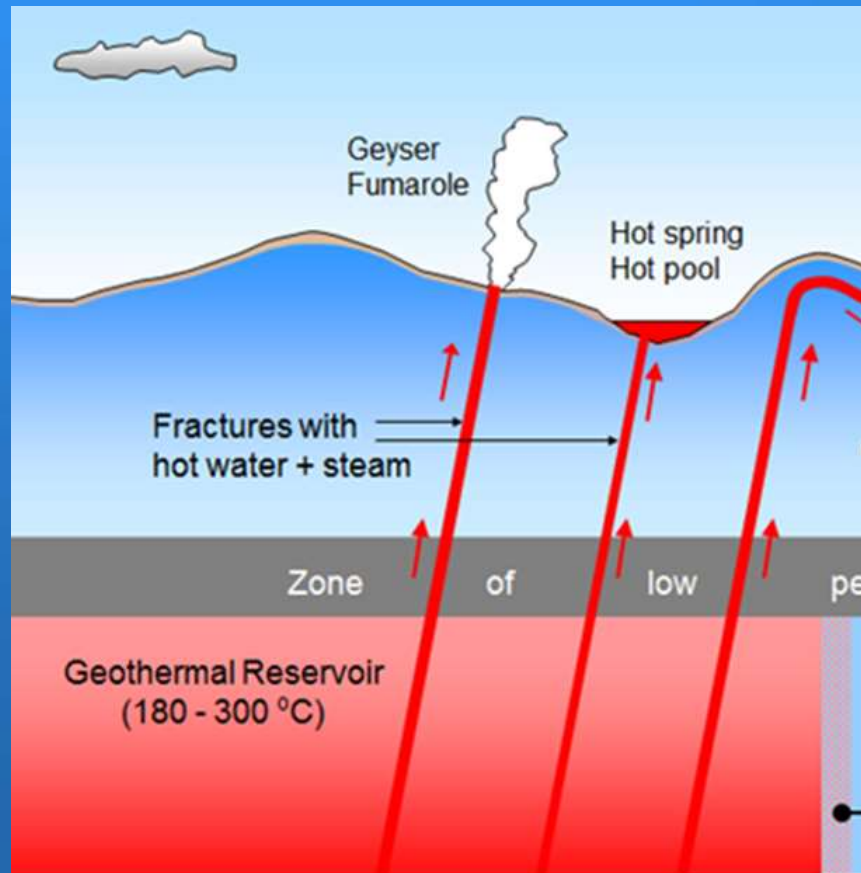
Rotorua City, life in a geothermal system

Some understanding how springs work



Rotorua City, life in a geothermal system

Primary Features (deep fluids)



Rotorua City, life in a geothermal system

Mixed fluids

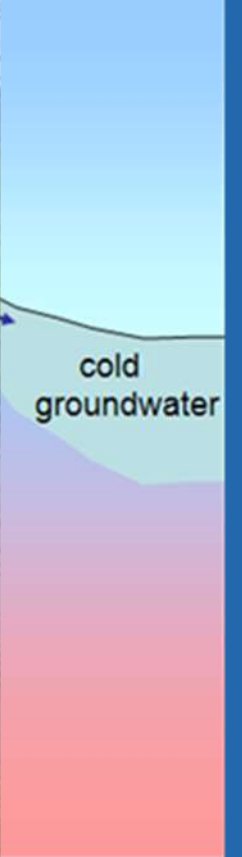
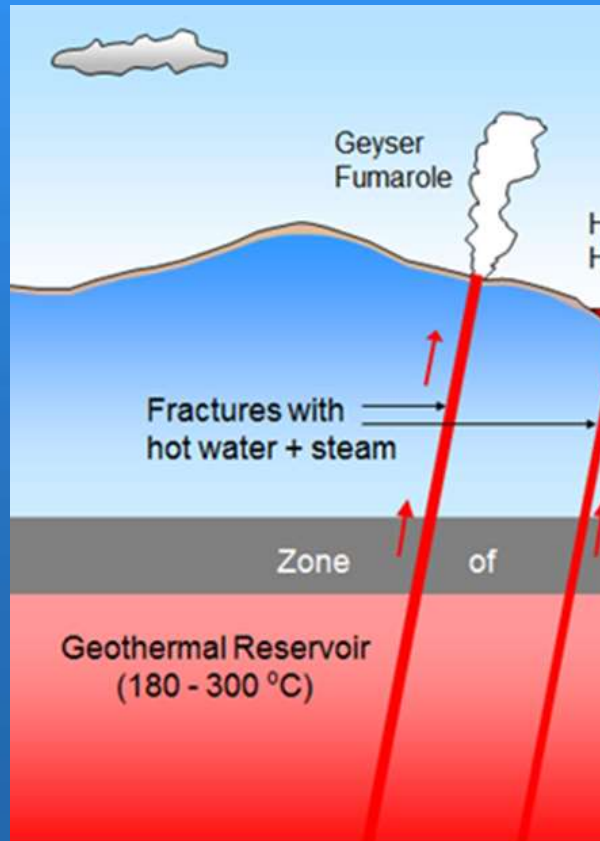


cold
groundwater

Boiling Zone

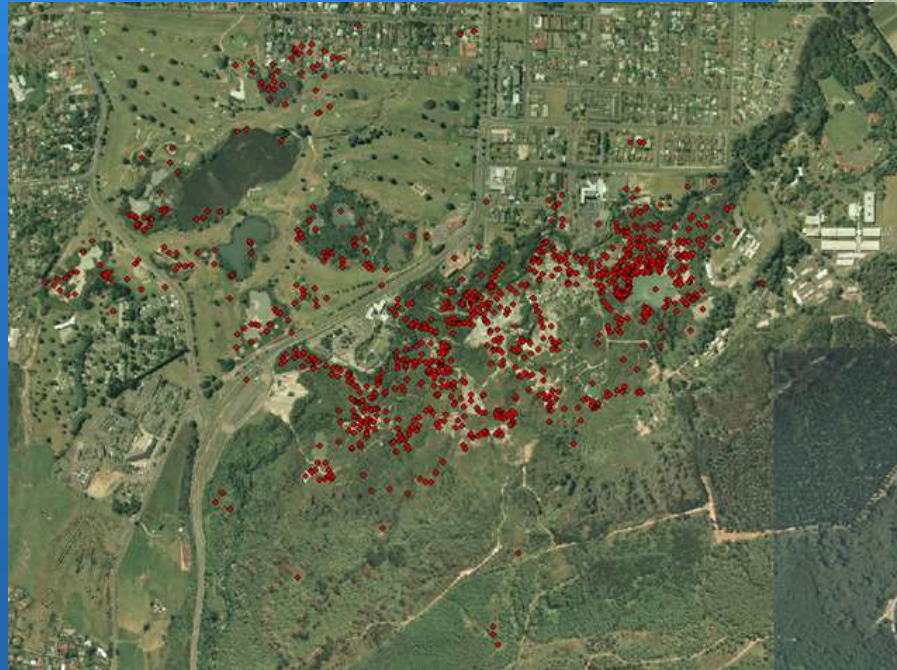
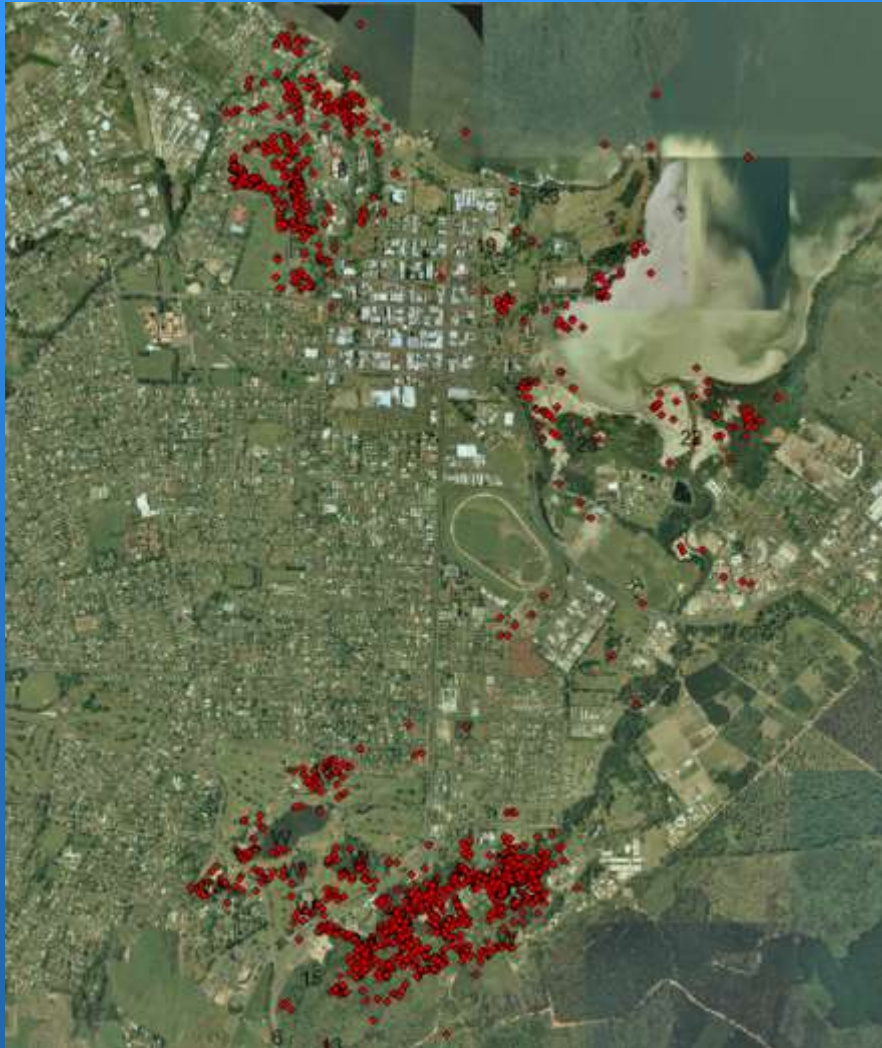
Rotorua City, life in a geothermal system

Steam feed features



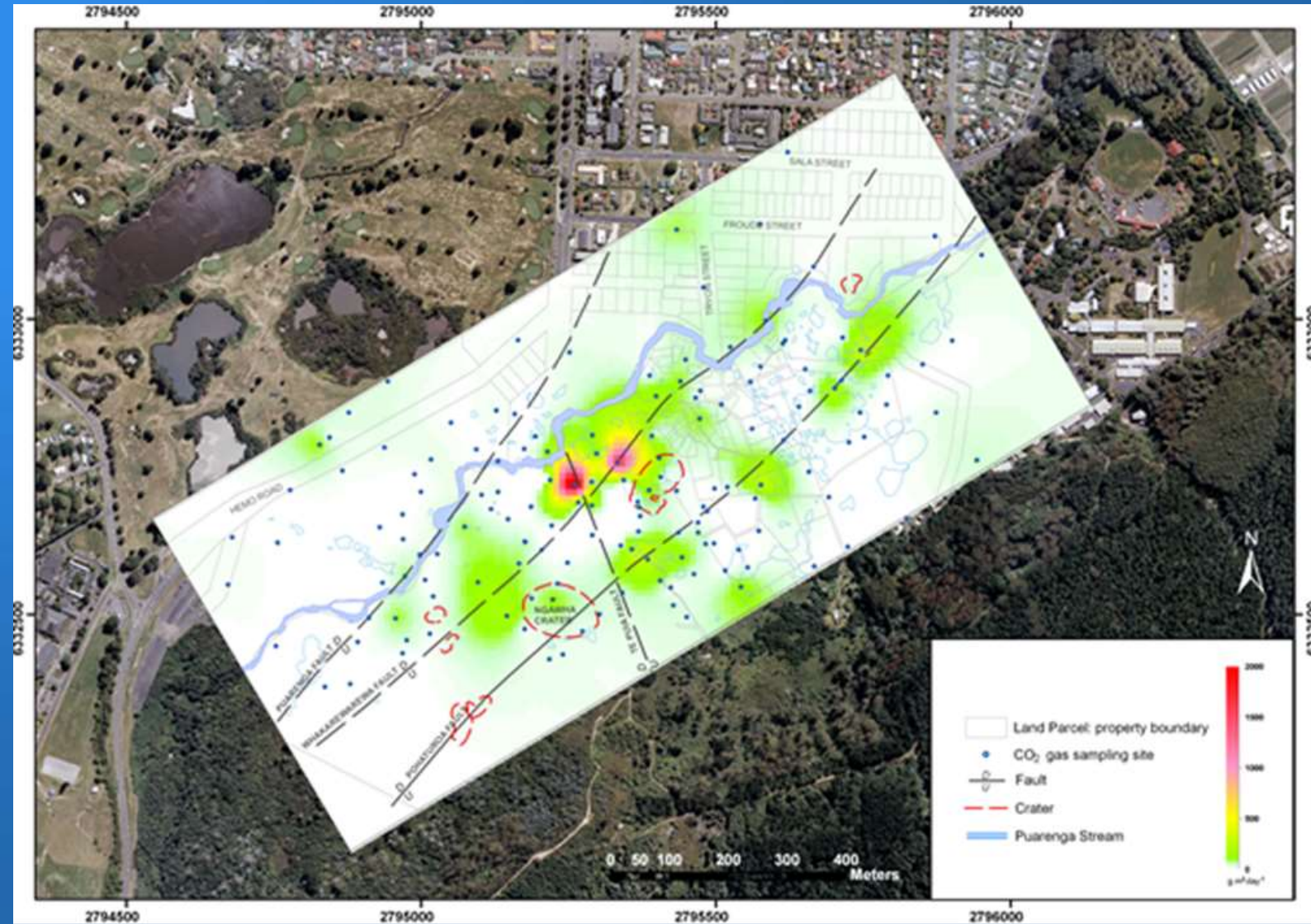
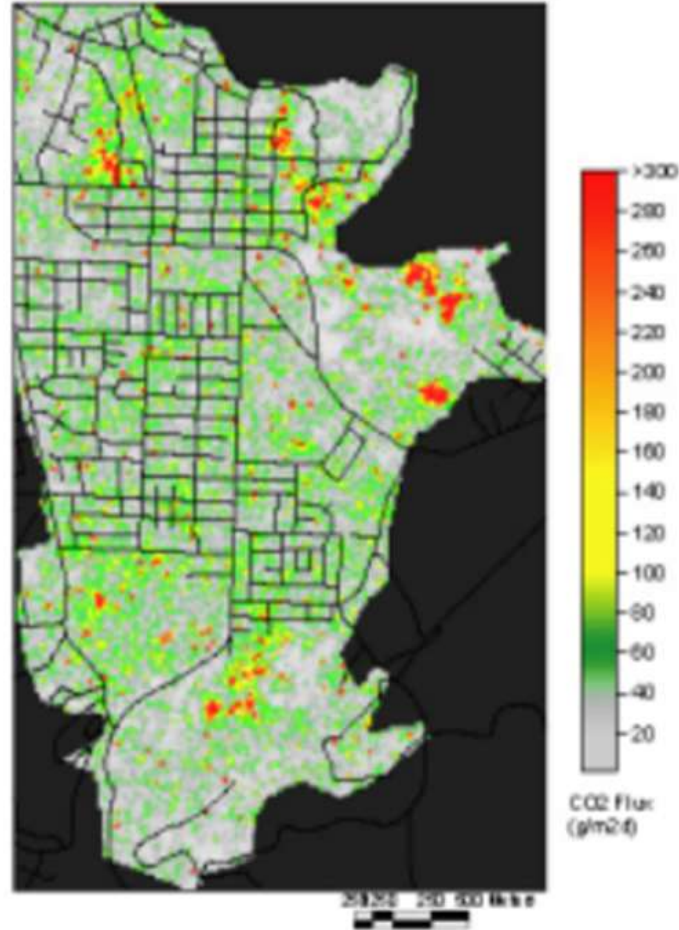
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Location of surface features



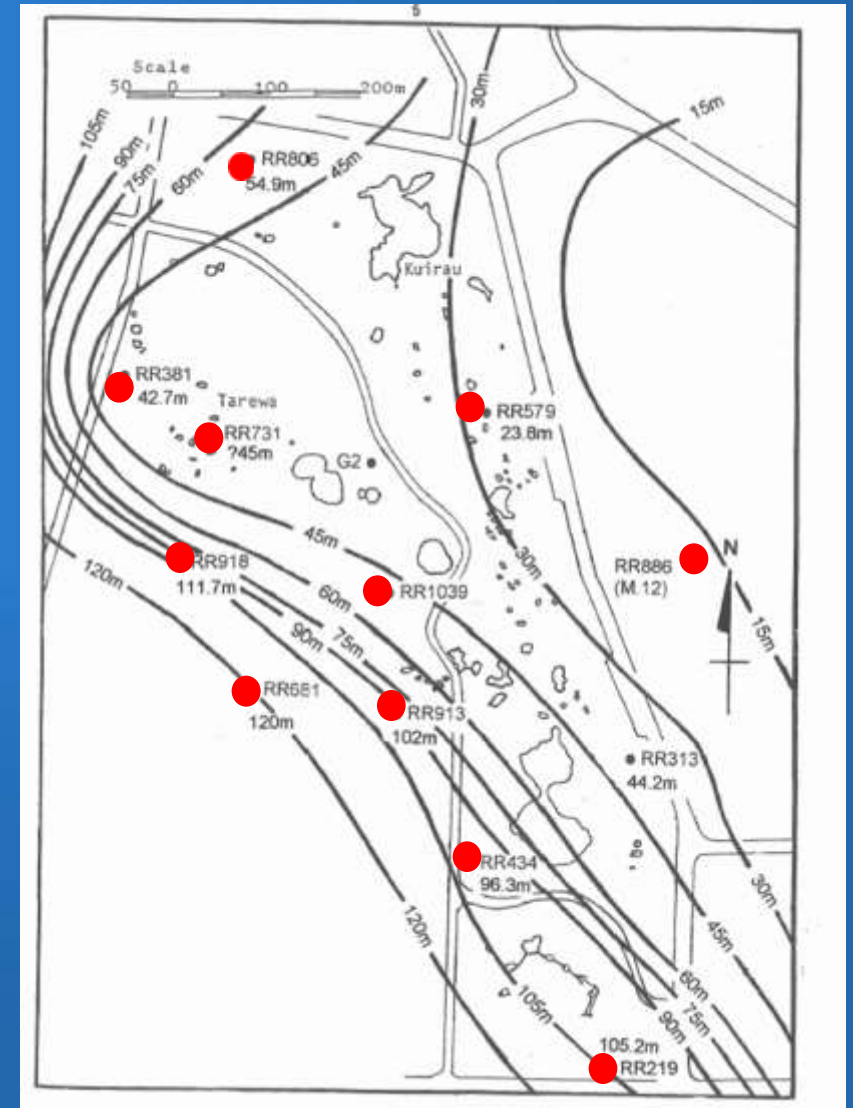
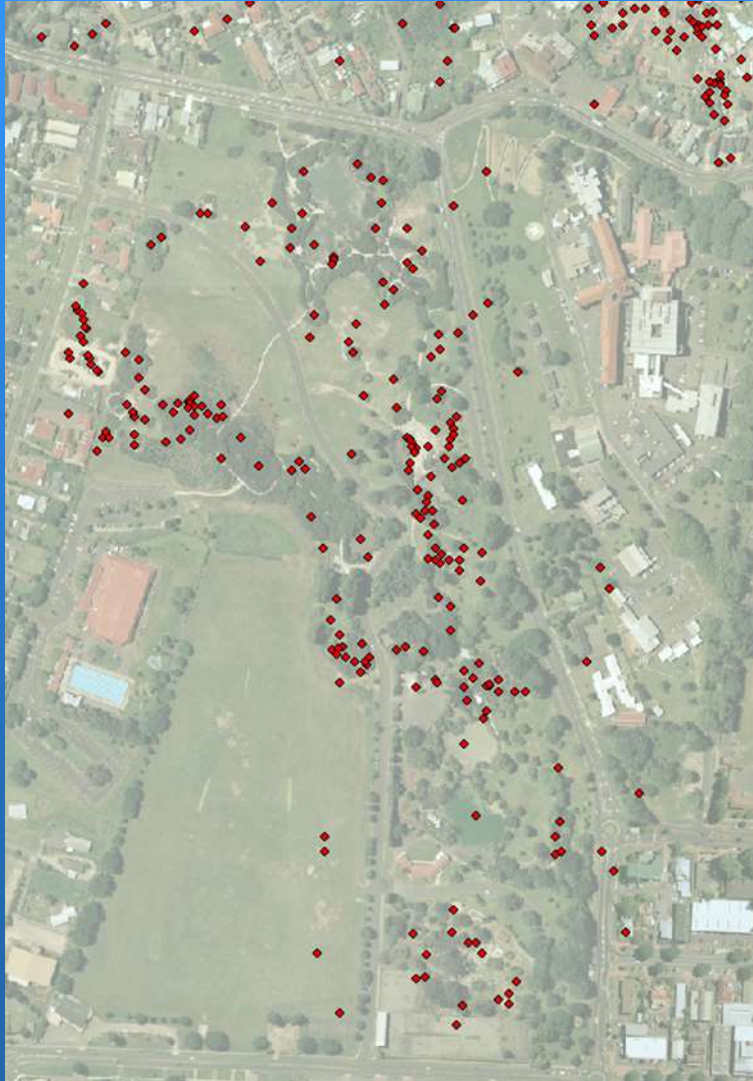
Rotorua City, life in a geothermal system

Gas, CO₂



Rotorua City, life in a geothermal system

Combining Surface features with drillhole data



Rotorua City, life in a geothermal system

The Bore wars

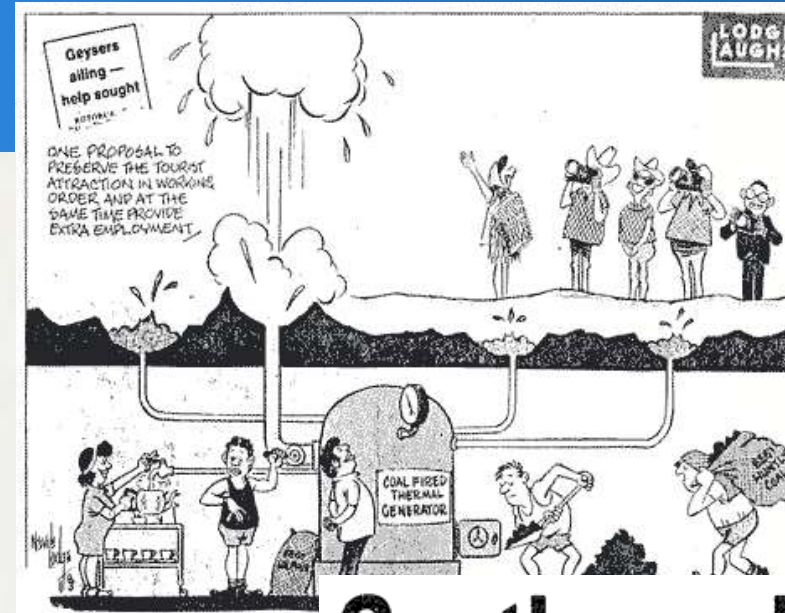
MINISTRY OF ENERGY PROJECT GEOTHERMAL

P.O. Box 1943, Rotorua Telephone 71 235



CLOSURE OF THIS BORE IS BEING UNDERTAKEN BY THE GEOTHERMAL INSPECTORATE PURSUANT TO POWERS CONFERRED ON GEOTHERMAL INSPECTORS UNDER THE GEOTHERMAL ENERGY REGULATIONS 1961. UNLESS EXPRESSLY AUTHORISED BY A GEOTHERMAL INSPECTOR NO PERSON MAY TAMPER OR INTERFERE WITH THIS BORE OR ITS EQUIPMENT IN ANY WAY.

ATTENTION IS DRAWN TO REGULATION 3(7) OF THE GEOTHERMAL ENERGY REGULATIONS 1961 WHICH MAKES IT AN OFFENCE TO WILFULLY IMPEDE OR OBSTRUCT AN INSPECTOR IN THE EXERCISE OF ANY POWER CONFERRED ON INSPECTORS UNDER THE GEOTHERMAL ENERGY ACT 1953 OR THE SAID REGULATIONS. ANY UNAUTHORISED TAMPERING OR INTERFERENCE WITH THIS BORE SHALL BE A BREACH OF THIS REGULATION.



Geothermal battle won

AUCKLAND UNIVERSITY associate professor of physics Dr Ron Keam has won a lengthy legal battle to stop the Ministry of Works and Development taking water from the Waimangu geothermal field, southeast of Rotorua.

His victory has thrown into confusion the future of many geothermal steam users in the Rotorua area who do not hold water

Tarawera eruption, was the only significantly sized one formed in historic times. This meant its complete history could be studied.

His successful appeal to the Planning Tribunal was later overturned by Chief Justice Sir Ronald Davison in the High Court on the grounds that the tribunal had gone outside their brief in seeking to control geothermal energy.

...rt of Appeal judges — Mr Justice Somers and Mr Justice — made individual decisions in favour of overturning an earlier ruling.

...s fight began in 1978 when he lost the granting of a right of alinity to take geothermal water for purposes from Waimangu.

...e area was unique because the tem. created by the 1886

Disputing this interpretation the Court of Appeal said there was some overlap between the Geothermal Energy Act 1953 and the Water and Soil Conservation Act 1967 (now being replaced by the 1981 amendment) in their definition of water.

But it said, where geothermal testing involved the use of "specified natural water" the provisions of the Water and Soil Conservation Act must be complied with — that is, a water right was necessary.

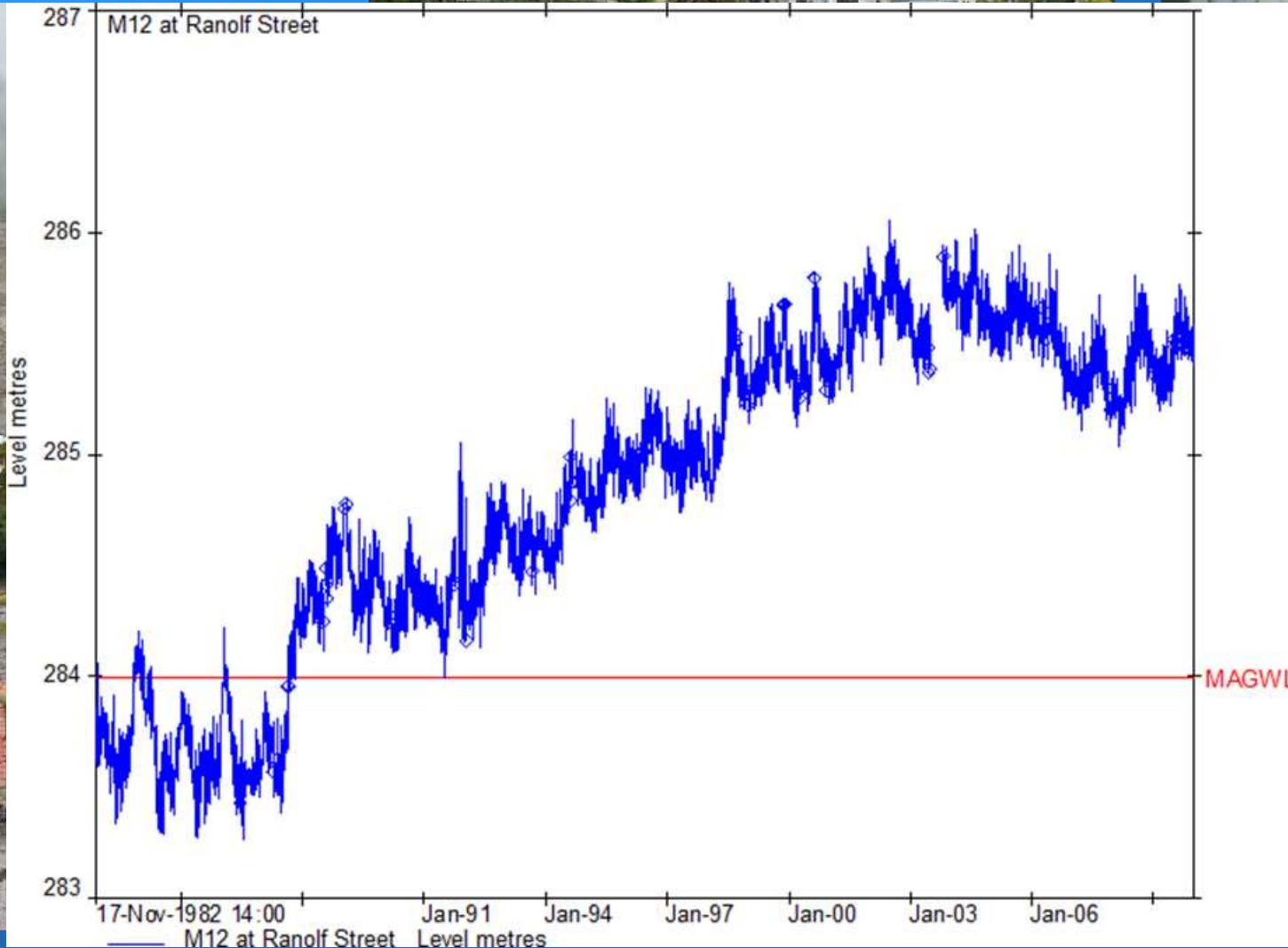
Rotorua City, life in a geothermal system

The Bore wars: the recovery



Rotorua City, life in a geothermal system

The Bore wars: the recovery



Rotorua City, life in a geothermal system

Hazards

Collapse holes

Downward percolation of ground water

Rising steam, acid fluids, long residence times

Gas

Steam eruptions

Failed bores (grouted ones)

Hot ground conditions



Rotorua City, life in a geothermal system

Response criteria



Set backs
No building over items
Close off area
Venting/back fill