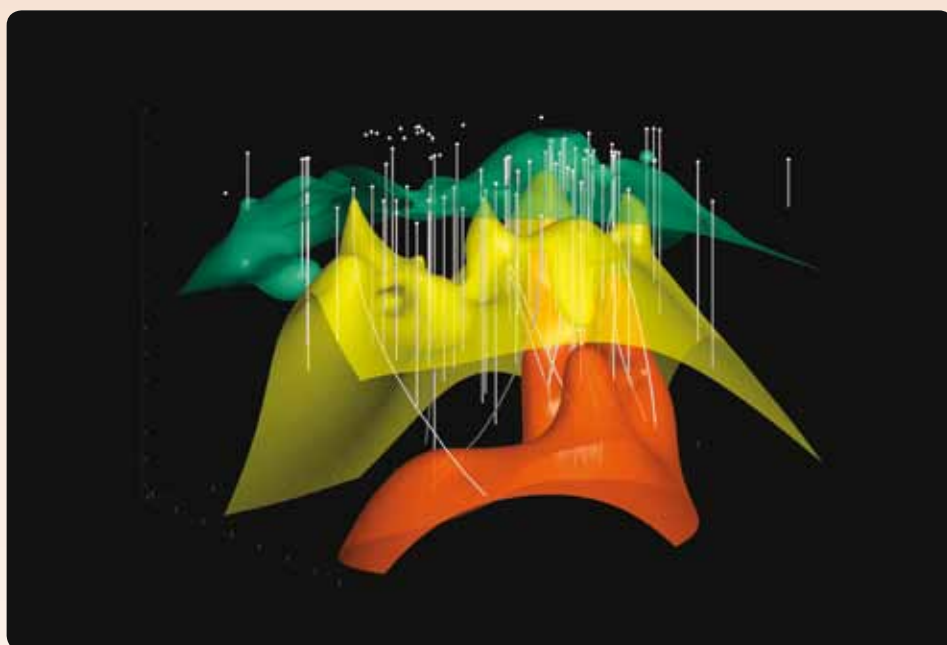


# geothermal exploration services

An integrated approach to understanding geothermal reservoirs.



GNS Science promotes geothermal development via a staged exploration strategy, supported at each step by specialist, multidisciplinary geoscience investigation.

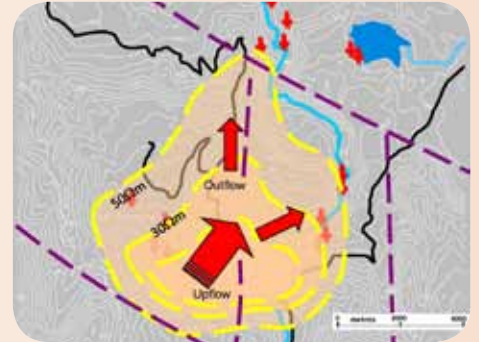
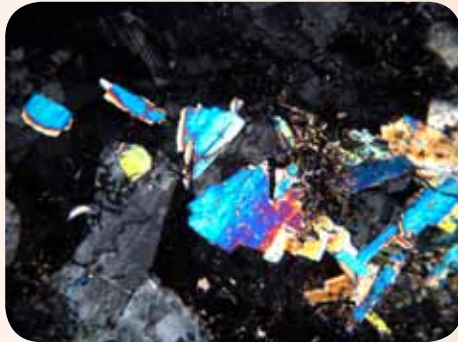
Our team integrates data gathered via geological, geochemical and geophysical techniques to delineate the geothermal system, assess the resource capacity, and understand the reservoir chemistry, temperature and hydrological structure. This enables exploration drilling and field delineation to proceed with a high level of confidence, and reduced cost and risk.

We provide a thorough understanding of geothermal reservoirs and underpin our laboratory and consultancy services with broad ranging geothermal research.

## at a glance →

- **Integrated** Geological, geochemical and geophysical expertise are combined to delineate and characterise geothermal reservoirs.
- **Innovative** Novel approaches such as: innovative 3D geological modelling of the geothermal reservoir; using 3D models to populate TOUGH2 model grids; borehole image logging to map downhole permeable structures; combined MT/seismic models to delineate resources.
- **Targeted** Geological investigations are used to recognise key production targets, controls on reservoir permeability, and potential formation problems within the reservoir. Targeting of permeability structures including faults, fractures and stratigraphic formations.
- **Detailed** Evaluation of geothermal water and gas chemistry provides clarity on the geohydrology and energy potential of the geothermal reservoir.
- **Feasibility studies** Evaluation of existing geoscientific data, and providing recommendations and expert advice for exploration programmes, licensing and consenting.
- **International** Locating, defining and characterising geothermal resources for a range of geological settings - volcanic arc, continental rift and ocean/island settings.

## Exploration services understanding geothermal reservoirs



## exploration services →

- **Field mapping** Undertake field surveys to map geology and structure, and to document the distribution and type of geothermal manifestations. The geology and structure of the target area is placed in its regional setting.
- **Geochemical survey and analyses** Sampling and evaluation of geothermal surface waters and gases. Analysis of major and trace ion components, as well as stable isotopes.
- **Geophysical exploration** Combined geophysical methods (MT, seismic, gravity, magnetics) to identify heat sources, permeability structures, fluid flow and drilling targets. Survey design, data collection, processing and modelling.
- **Petrology services** Detailed mineralogical analyses of surface rocks, drill core and cuttings using optical microscopy, XRD and fluid inclusion analysis. Inferring reservoir temperatures, chemistry, and geohydrological changes.
- **Reservoir modelling** Development and updating of conceptual and numerical reservoir models, incorporating all available geoscientific information.
- **Due diligence** Independent, expert advice. Review of existing studies and geoscientific data. Peer review and support for geothermal consent applications.
- **Training** Introductory to specialist level. Tailored knowledge transfer and capability building in geology, geochemistry, geophysics and reservoir engineering. Classroom-, laboratory- and field-based.

## about us →

The GNS Science geothermal team is internationally recognised for innovative, robust geoscientific research, expertise and consultancy advice. We have been supporting the geothermal community in New Zealand and internationally for over 50 years.

Our experienced professionals integrate geology, geophysics, geochemistry and modelling expertise for exploration, drilling, environmental sustainability, field development, optimal production, and ongoing resource management

## contact us →

Contact us to find out how we can address your unique question, and support the success of your project.

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