

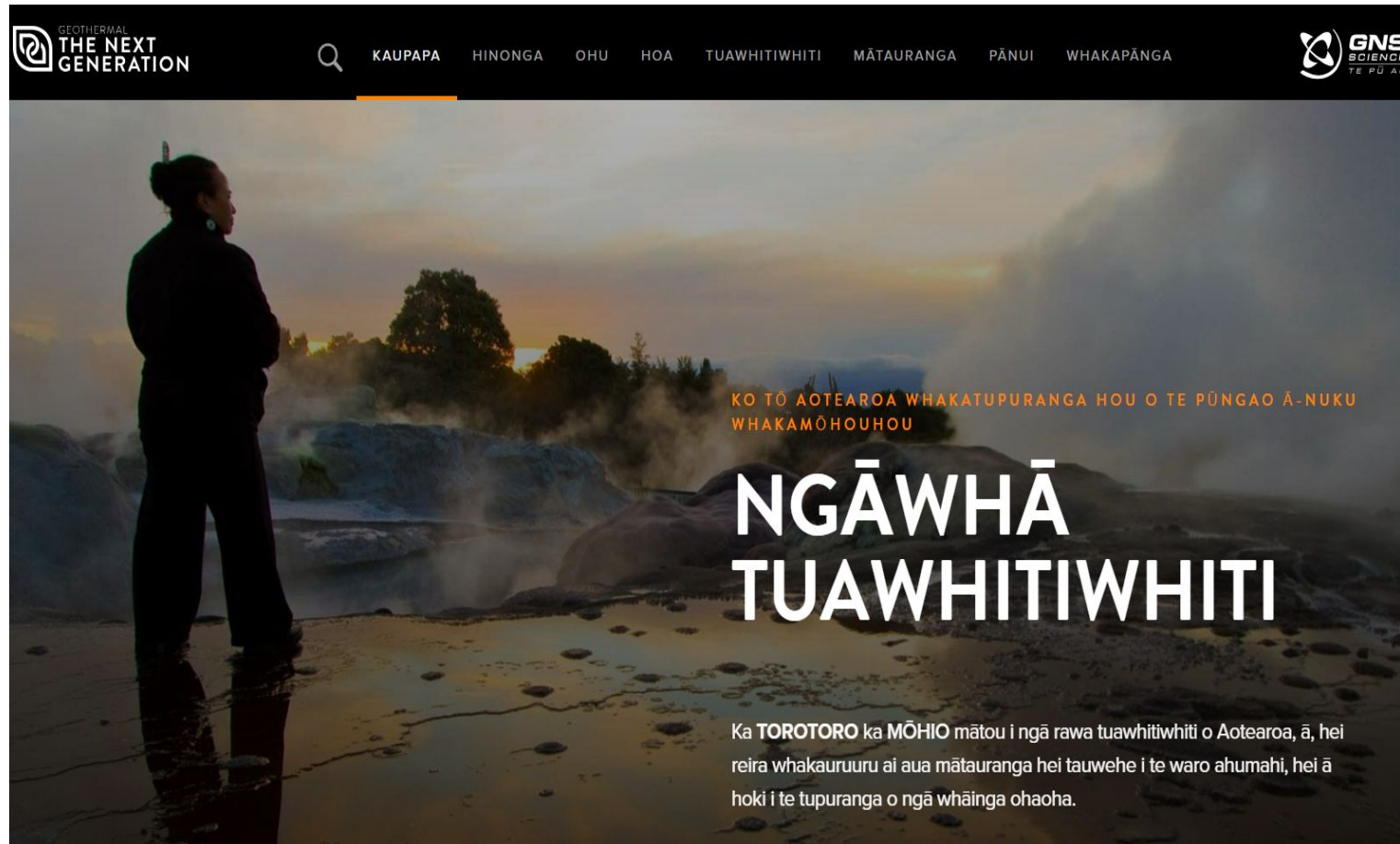
Waiwhatu Project Update

NZGA WINTER SEMINAR
3rd July 2024

Aroha Campbell

Background

- GNG Māori first engagement strategy
 - We weren't seeking to 'educate Maori'
 - We decided to take a different approach and help our science team see things differently.
 - Science is hard to relate to and scientists find it hard to relate to indigenous thinking
 - Develop website in Te Reo - difficulties with translating the scientific terms



Team

The project team balanced a range of ages, genders, skills and experience:

- Aroha Campbell**¹ (Ngāti Tahu): A kaitiaki consultant who has deep experience navigating geothermal developments and Te Ao Māori.
- Uenuku Fairhall**² (Ngāti Rangiwewehi, Waitaha): An expert Te Reo Māori linguist and fluent speaker who holds the underlying concepts of Te Ao Māori, including whakapapa, mātauranga, noa and tapu.
- Corey Rehua**³ (Te Arawa, Tainui, Mātaatua): An early career Māori researcher and engineer, with a broad range of interests, who is on a reo journey.
- Paul Siratovich**¹: A senior scientist (geologist) who understands core geothermal concepts and terminology who is on a Te Ao Māori journey.
- Andy Blair**¹: A strong communicator, with a background in science and is comfortable in Te Ao Māori, who can help translate the concepts.

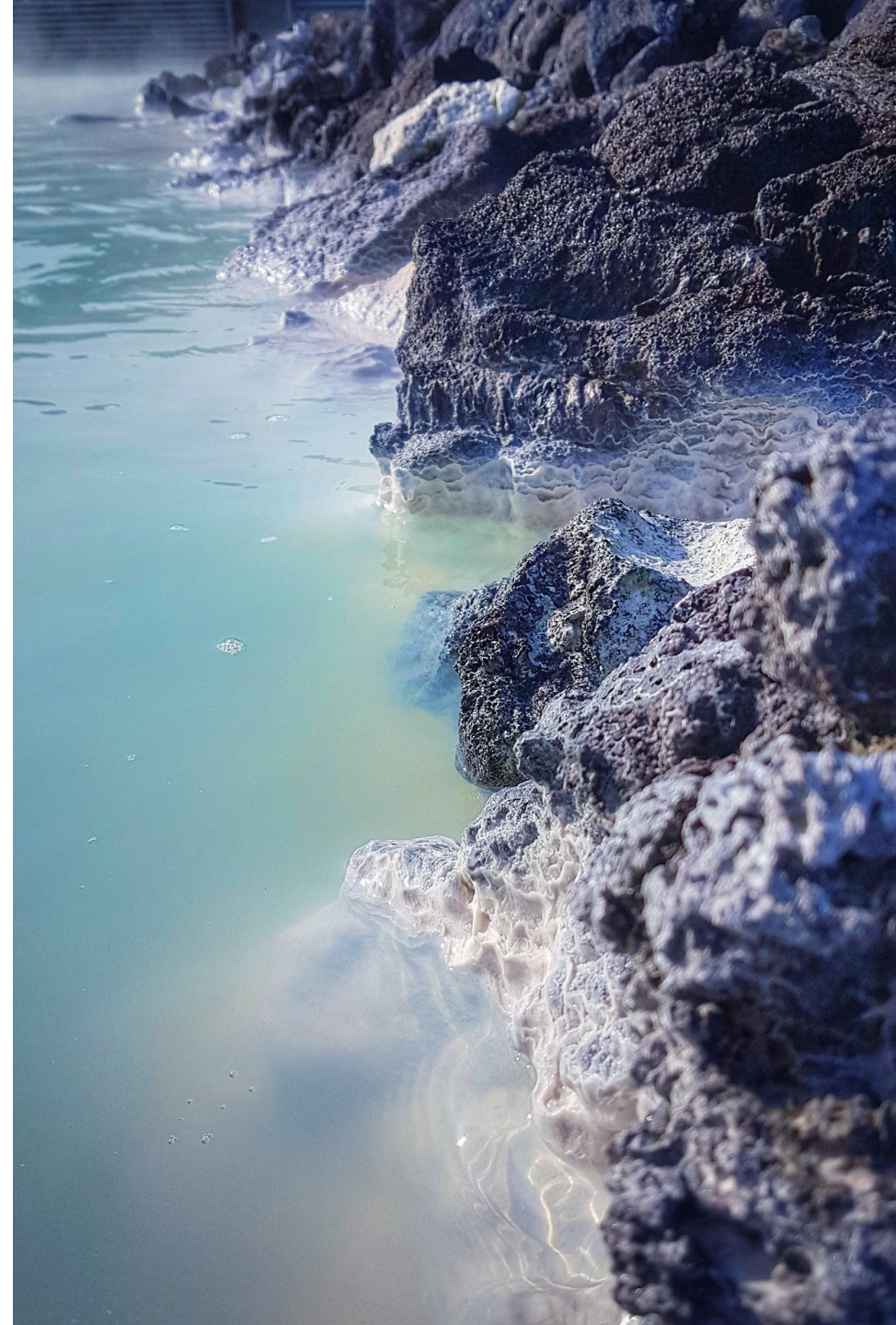
¹Upflow ²Tarapō ³Mountain to Tide

Kupu Development

- Most common technical words used when describing geothermal.

Terms selected:

- Geothermal fluid
 - Reservoir
 - Enthalpy
 - Magma
 - Lava
- Scientist explain technical word, concept, foundation, meaning – this was interrogated for understanding
 - Interpreted through a Māori lens – how Māori see these concepts
 - Bringing Mātauranga Māori (indigenous knowledge) and western science into one space.
 - Tested the words internally and externally
 - Not about 6 words – the beginning of journey of shared understanding and inclusion



WAIWHATU

[why-fuh-too]

GEOHERMAL FLUID

The liquid present inside a geothermal reservoir that can flow to the surface naturally or through wells.

wai – liquid, oil etc;
whatu – stone, core

MĀPUNA

[mar-poo-nah]

RESERVOIR

The section of a geothermal field below ground that is so hot and permeable that fluid can be economically extracted for the production of fluid and heat.

māpuna – to well up, to form a pool

An industrial scene with large pipes and structures, overlaid with a semi-transparent red filter.

NGAOHŪ
[ng-ow-hu]

ENTHALPY

The sum of the internal energy and the product of the pressure and volume of a thermodynamic system.

ngao – strength, energy;
hū – still, at rest.

A close-up of molten lava, overlaid with a semi-transparent red filter.

TOKAREWA
[toh-car-reh-wah]

MAGMA

Extremely hot molten or semi-molten rock that exists exclusively underground.

toka - rock; **rewa** - to melt, to become liquid

RANGITOTO

[rung-ee-taw-taw]

LAVA

Molten rock that has been erupted at the surface of the earth, magma that has now become lava.

rangitoto – black lava, scoria; said to be the blood from Tamatekapua's nose.

KŪWHEWHEWHEWHE

[koo-feh-feh-feh-feh]

WRINKLING

kūwhewhewhe – puckered, wrinkled. Te Arawa term for wrinkling of the skin after being in water for a long time.

Nga Waiwhatu Kupu Live!

Te Ao Ngāwhā Geothermal
Accredited to: Upflow/Tarapō/Mountain to Tide/GNS Science
Kūwhewhewhewhe Wrinkling
Māpuna Reservoir
Ngaohū Energy in system
Rangitoto Lava
Tokarewa Magma
Waiwhatu Geothermal Fluid

11:47am 14th June 2024



TE TAURA WHIRI | TE REO MĀORI | THE MĀORI LANGUAGE COMMISSION

Marae Stay

6-7th October 2023 Ohaki Pa



Sharing of Whakapapa & Stories



Feedback from Ohaki Marae

Stay 6-7 October 2023

“beautiful, perfect experience...human to human contact..”

“[Haukainga] were great hosts & very welcoming...Mark & Leo were keen to share their stories –

I loved it, it was big part of the reason why I enjoyed it.”

“....A warm, comfortable environment...organic conversation...”

“There’s only so much you can learn about NZ reading a book...”

I liked how whanau were genuinely interested and listened to us and that was reflected in the questions that they asked.”

Most relaxed marae experience I’d ever had....I can’t image a more comfortable environment

I loved the fact that we stayed overnight as you experienced so much more than you would of you just went for a few hours..

Needed to have more clarity to offer them about the big issues like subsidence/less pollution & less surface infrastructure for supercritical

Added to my general understanding/hadn’t stayed before on that level... valuable, amazing hosts... lovely felt really welcome...”

“Coming to NZ has been a steep learning curve for me but I learnt so much by experiencing that...”

I have done Treaty of Waitangi training and going there I felt better equipped to understand the concerns and historical mistreatment of the people. I think everyone should do that training...

...they made us feel so welcome...

“It was a real vibe...light-hearted fun”

human to human experience

Loved the jokes!

Everybody...even people in NZ should know NZ history

Whats Next?

- The Māori Strategy team at GNS Science to build on the Waiwhatu work with 'Arawhata' (bridge)
- Develop more kupu and gain visibility around the work to encourage others to do the same
- Find out more - GNS Te Arawhata Project & GNS Science Geothermal Stakeholders Breakfast, Thurs 4th July
- Andy will present a paper outlining the methodology, workstream, learnings and lessons at Geothermal Rising Conference in Hawaii in Oct. *The Waiwhatu Project: Developing Shared Language (English-Te Reo Māori) for Communicating Geothermal Scientific Terms*

