ABSTRACT

PRODUCTION AND REINJECTION STRATEGIES AT OHAAKI-BROADLANDS GEOTHERMAL FIELD

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On the West Bank of Ohaaki, The Ohaaki Rhyolite consists of eastward-thinning flows and coulées from an unknown source outside the field to the west. Similarly, the older Broadlands Rhyolite (B) is a northeast-trending flow lobe from a nearby source outside the southwest margin of the field. Both rhyolites have permeable margins ideally suited for reinjection sinks. Testing has shown that reinjection fluids will disperse within these rhyolites and not affect the Ohaaki production wells provided reinjection wells are sited more than 1 km away and not adjacent to faults.

On the East Bank, Broadlands Rhyolite (A) is a small buried dome, strongly fractured and mineralised, on the crest of a basement horst. The overlying Broadlands Dacite consists of westward-thinning flows and coulees from a source near the southeast field margin. Primary permeability on the East Bank is low because the thin Waiora and Rautawiri "aquifers" are partly self-sealed below the Ohaaki Rhyolite, Huka Falls Formation and Broadlands Dacite.

Production is reliant on secondary permeability in steep northwest-dipping normal faults on the northwest flank of the basement horst and on associated hydraulic fractures below the capping formations.

Temperature/pressure data support a single source in the southeast, possibly the cooling rhyodacitt magma chamber that fed the Broadlands Dacice and Rhyolite A. High temperatures (310°C) exist in the mainly impermeable basement rocks.

Fluids flow from southeast to northwest in horizontal "aquifers" and hydraulic fractures and escape to the surface at Ohaaki through the Ohaaki Rhyolite along northeast-trending active faults.