



## Orakeikorako<sup>1</sup>

<b>Site Number:</b>	SNA559
<b>Ecological District:</b>	Atiamuri
<b>Source of Information:</b>	Wildland Consultants (2007b)
<b>Digital Scale:</b>	1:5,000
<b>Data Source:</b>	WRAPS 2007
<b>Regional Council</b>	Waikato
<b>1998 Site Number:</b>	NHS No. 559 (Waikato Geothermal Site Number U17/11)
<b>Current Tenure:</b>	Unprotected
<b>Site Area:</b>	38.2 ha
<b>Altitude Range:</b>	300-370 m
<b>Bioclimatic Zone:</b>	Lowland
<b>Grid Reference:</b>	NZTM E1874726, N5736937

VEGETATION		LANDFORM	EXTENT
CODE	TYPE		
1	<ul style="list-style-type: none"> <li>Nonvegetated raw-soilfield</li> </ul> <p>This large sinter deposit is the most prominent geothermal feature of the site. Mineral pools occur throughout this feature, with some geysers along its edge. There are patches of bare ground, steaming fumaroles, and mud pools throughout this site, but these were too small to map within the context of this project.</p> <ul style="list-style-type: none"> <li>Geothermal water (not mapped)</li> </ul> <p>Hot seepage, hot springs.</p> <ul style="list-style-type: none"> <li>Prostrate kanuka shrubland (not mapped)</li> </ul> <p>Low prostrate kanuka (&lt;0.5 m high) forms a sparse canopy in local areas around the margin of Type 1a. <i>Baumea juncea</i> and oioi occur in cooler wet areas.</p>	Hillslopes and alluvial terrace  Geothermal water	2.0 ha
2	<p>Mercer grass grassland</p> <p>A small area of grassland dominated by Mercer grass with local <i>Gleichenia microphylla</i>, <i>Histiopteris incisa</i> and <i>Paesia scaberula</i>. <i>Cyperus ustulatus</i> and <i>Baumea juncea</i> occur around a small thermal seepage.</p>	Alluvial terrace	0.1 ha
3	<p>Prostrate kanuka scrub</p> <p>Prostrate kanuka (1-2 m high) forms a dense canopy with mingimingi and manuka scattered throughout. Prickly mingimingi and karamu are also present. The groundcover comprises local <i>Lycopodiella cernua</i>, <i>Dicranopteris linearis</i>, Indian doab, and bracken, with turutu and <i>Dicranoloma</i> sp. scattered throughout. Fumaroles occur throughout. Wilding pine control has recently been carried out in parts of this area and some felled pine trees were observed.</p>	Hillslopes	3.0 ha
4	<p>Maritime pine-radiata pine/manuka-mingimingi forest</p> <p>Emergent wilding pines (maritime pine and radiata pine) occur over manuka and mingimingi, with kanuka and prostrate kanuka scattered throughout and occasional karamu and kohuhu. The ground-cover comprises <i>Gleichenia microphylla</i>, bracken, <i>Paesia scaberula</i>, <i>Histiopteris incisa</i>, kiokio, and turutu, with large local patches of <i>Dicranopteris linearis</i>, and small local patches of Indian doab. Fumaroles are scattered throughout and there are seepages adjacent to Lake Ohakuri. Scattered populations of <i>Christella</i> sp. 'thermal' occur near heated water on lake margins.</p>	Hillslopes and alluvial terrace	9.9 ha

<sup>1</sup> This site was called Orakeikorako B in Shaw and Beadel (1998).

VEGETATION		LANDFORM	EXTENT
CODE	TYPE		
5	<p>Manuka-mingimingi scrub ↔ radiata pine-maritime pine/karamu-wheki-mamaku scrub</p> <p>This area comprises a mosaic of manuka-mingimingi scrub and radiata pine-maritime pine/karamu-wheki-mamaku scrub, where manuka-mingimingi scrub is the predominant vegetation type. Fumaroles occur throughout, and prostrate kanuka is associated with areas of heated soil.</p>	Hillslopes and alluvial terraces	23.2 ha

**Indigenous Flora:** Prostrate kanuka ('At Risk - Naturally Uncommon' in de Lange *et al.* 2009) is present. *Dicranopteris linearis* ('At Risk - Naturally Uncommon' in de Lange *et al.* 2009), known from c.20 sites in New Zealand, is common throughout the site. At least 50 plants of *Christella* sp. 'thermal' ('At Risk - Declining' in de Lange *et al.* 2009) are located on the eastern margins of Lake Ohakuri. At least another 50 plants of *Christella* sp. 'thermal' are located in the wetland located behind the accommodation facilities on the western side of the lake, as well as one population of *Cyclosorus interruptus* ('At Risk - Declining' in de Lange *et al.* 2009).

*Lycopodiella cernua*, *Psilotum nudum* and *Campylopus capillaceus*, both species characteristic of geothermal areas, also occur here.

*Schizaea dichotoma* ('At Risk - Naturally Uncommon' in de Lange *et al.* 2009) and *Nephrolepis flexuosa* ('At Risk - Declining' in de Lange *et al.* 2009) are present. *Calochilus robertsonii*, ('At Risk - Naturally Uncommon' in de Lange *et al.* 2009) and *Prasophyllum pumilum* have also been recorded from this site in the past (Given 1989).

Other species of interest which occur at Orakeikorako include *Microtis parviflora*, *Prasophyllum pumilum*, *Thelymitra carnea* (Bellingham 1985), sea rush and *Limosella lineata*.

**Fauna:** No threatened or at risk species as listed in Hitchmough *et al.* (2007) or Miskelly *et al.* (2008) are known from this site.

Common indigenous and introduced bird species typical of the habitats are present including grey warbler, silvereye, North Island fantail, Australasian harrier, tui, North Island robin, spur-winged plover, mallard, and Australian magpie.

**Notes on Overall Condition:** Wilding pines are present. However, the overall condition of the understorey is good, with few weeds and a notable absence of blackberry. However, if pines are not managed the quality of the significant geothermal vegetation will deteriorate. The area is managed primarily for tourism, and has well maintained access tracks.

<b>Threats/Modification/ Vulnerability:</b>	<p><b>Invasive Exotic Plants:</b> In 1961, the Waikato River was artificially dammed to form Lake Ohakuri and c.75% of the geothermal features were destroyed by flooding (Lloyd 1972 in Given 1989). Since then, the biological and geothermal diversity of this area has deteriorated further due to an increase in the abundance of invasive exotic plants (Given 1995), particularly wilding pines (mainly maritime pine with some radiata pine) which comprise about 25-50% cover. Spanish heath (1-5% cover), blackberry (1-5% cover), Japanese honeysuckle (1-5% cover), and pampas (1-5% cover) are also present.</p> <p><b>Human Impacts:</b> This area is managed as a tourist facility and the geothermal features of the area are valued, with well-maintained tracks and viewing sites keeping further human impacts to a minimum. A large part of this site was flooded by the filling of Lake Ohakuri for electricity generation in 1961 (Cody 2007).</p>
<b>Risk Assessment:</b>	<p>Exotic wilding pines: Risk to site - high; Timeframe - high. Other pest plants: Risk to site - medium; Timeframe - high.</p>
<b>Significance Level:</b>	At least National (Appendix 5 - Table 1 - Criteria 3, 5, 7, 9; Table 2 - Factors G, H).
<b>Significance Justification:</b>	<p>This site is of at least national significance because it is one of the best examples of geothermal vegetation in the Waikato Region. Geothermal vegetation is a naturally uncommon vegetation/habitat type. It contains one of the largest populations of <i>Dicranopteris linearis</i> ('At Risk - Naturally Uncommon') in New Zealand. It also supports a relatively high number of other notable geothermal plant species, including (<i>Christella</i> sp. 'thermal'; 'At Risk - Declining'), <i>Schizaea dichotoma</i>, and <i>Calochilus robertsonii</i> (both 'At Risk - Naturally Uncommon'), as well as a high diversity of geothermal features including steamfields, mud pools, fumaroles, small geysers, hot springs and sinter terraces. Some of these features have been ranked as being of international and national significance (Cody 2007).</p>
<b>Fieldwork Required:</b>	No. The site was surveyed in 2007.
<b>Notes:</b>	<p>Given (1996) assessed the botanical value of many of the geothermal sites in the Waikato Region. This site was classed as Category A - the highest category.</p> <p>Wilding pine control has been carried out on the southeast side of the large sinter feature. Further control should be undertaken, with the aim of total control within the key geothermal area. It is also important to ensure that the botanical significance of the site is recognised, as well as the geothermal features.</p> <p>Cody (2007) describes a diverse range of geological features at this site, including geysers, alkaline and acid springs, hot altered barren ground fumaroles, steaming cliffs, mudpools, and sinters. The large silica terrace and one spring at the site were ranked as being of international significance, while many other features were ranked as being of national, regional, and local significance.</p>
<b>References:</b>	Beadel (1995a); Beadel and Bill (2000); Cody (2007); Ecroyd (1986); Given (1989 & 1995); Smith-Dodsworth (1993); Spring-Rice (Unpublished); Wildland Consultants (2007b).