



Site Description

Mason Valley

(updated 2012)

Geologic setting: The Wabuska geothermal area is located at the northern margin of Mason Valley. Thermal springs coincide with a northeast-trending zone of faults (Stewart, 1999) referred to as the Wabuska lineament (Stewart, 1988). According to Russell (1885, p. 48, 49), the springs run east-west along a post-Lahontan fault, which is visible along an irregular scarp up to 6 m high.

Geothermal features:

Wabuska Hot Springs ([Map](#)): Hot springs north of Wabuska range from 59 to 72°C and occur over a large area (Secs. 14,15,16,23, T15N, R25E). Gas bubbles issue from the pools with a faint odor of H₂S (Stearns and others, 1937). According to Russell (1885), water was collected and evaporated, forming sodium sulfate, calcium sulfate, and calcium carbonate salts. The American Sodium Co. refined and shipped sodium sulfate from Wabuska in the 1930's, and it was suggested that a present-day company re-establish sodium sulfate refining (Davis and Ashizawa, 1960). Samples of mixed sodium chloride and sodium sulfate show minor amounts of potash but no lithium, rubidium, cesium, nitrate, phosphate, or borate salts (Moore, 1969, p. 40).

In 1959 Magma Power Co. drilled three steam wells in the Wabuska area. Two of the wells were shallow (less than 183 m) and the third was drilled to 678 m, with a maximum reported temperature of 108°C. Several water wells in this area have temperatures above 27°C. Also, a well about 6.4 km to the southeast reportedly has 21°C water. Samples of water from the Magma Power Co. wells yield estimated reservoir temperatures of 145 and 152°C based on silica and Na-K-Ca geothermometers (Mariner and others, 1974).

The Wabuska power plant came on-line in 1984 and has an equipment generating capacity of 2.2 MW. In 2006, electrical production was 8234 MWh gross with 5,120 MWh net generation (Nevada Division of Minerals, 2007). Not only was Wabuska the first geothermal power plant constructed in Nevada, it produces electricity from the coolest reservoir, and is the smallest plant. During the 1980s, two 0.6 MW binary units were installed that produce from a 107°C reservoir at 107 m, and discharge spent fluids to a wetland rather than reinjecting. Wabuska 1 began operating in 1984, and Wabuska 2 was operational in 1987. A retrofit in 1997 changed the working fluid from fluorocarbon to isopentane. The plant was purchased by the Egbert family in 2000. The production zone is Quaternary gravels and sands; geothermal fluid may circulate along faults related to the Wabuska



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lineament as well as an unconformity above Mesozoic metasedimentary rocks possibly present at depth (NBMG files). Long and Brigham (1975a) and Peterson (1975) have reported on audiomagnetotelluric and gravity data in the Wabuska area.

In 1972 Agri-Technology Corp. built greenhouses near the site of the steam wells. The company grew vegetables hydroponically, with well water heating the greenhouses, but quickly went out of business. A geothermal-powered ethanol plant, using grain as a feedstock, was constructed by Tads Enterprises at Wabuska in the early 1980s, and produced gasohol for several years. The area has also seen efforts to grow spirulina algae and several pilot studies to raise Malaysian prawns, catfish, and tropical aquarium fish (Hess and Garside, 1994). None of these non-electric uses were active in 2002.

A geothermally-powered biodiesel plant, Infinifuel Biodiesel, was developed at Wabuska in 2006, but appears to be out of business ca. 2010. The plant used 104°C steam from the Wabuska power plant in the refining process. The site included 17 stainless steel tanks, a 5,000 sq. ft building, two methanol recovery distillation towers, oilseed storage, crushing and pressing facilities, and 300 acres for expansion. The two biodiesel reactors had a 22,000 gallon per day capacity, for anticipated biodiesel production of five million gallons per year. [http://web.archive.org/web/*/http://www.infinifuel.com/wabuska.htm]

Wilson Hot Springs, Barren Hills: Wilson Hot Spring (SE $\frac{1}{4}$ SW $\frac{1}{4}$ Sec. 34, T11N, R25E; Yerington 15-minute topographic map) was reportedly dry in 1969 (Alvin McLane, personal commun., 1973), with steaming ground at the site (Williams, 1996, p. 6). A temperature of 94°C was measured at a fumarole in 1983 (Robert Mariner, unpubl. data). Between 1976 and 1978 Chevron drilled 34 exploratory boreholes ranging in depth from 30.5 to 609.8 m and found temperatures ranging from 16.3 to 90.9 °C (Sass and others, 1999). No information is available on the other Mason Valley hot spring 9.6 km to the north (NW $\frac{1}{4}$ NE $\frac{1}{4}$ SW $\frac{1}{4}$ Sec. 34, T12N, R25E, about 0.5 km west of the West Walker River).

Leasing information: The Barren Hills property, located 12 km south of Wilsons Hot Springs, spans 5154 acres in an area previously explored by Chevron Oil Company. Chevron drilled 44 TG holes during the late 1970's and early 1980's and conducted various geological and geophysical studies. The former Sierra Geothermal Power completed gravity and airborne ZTEM surveys on the property. Since SGP was acquired by RAM Power in 2010, its future is uncertain.



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Bibliography:

