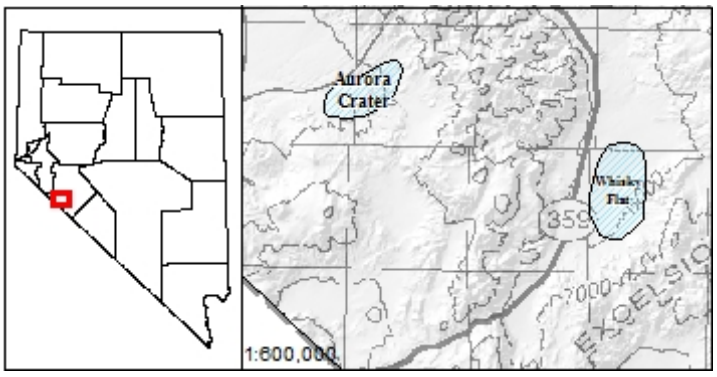
Site Description

Aurora Crater
(Updated 2015)



Geologic setting:

The Aurora Crater geothermal area is located in western Mineral County, northeast of Mono Lake. The geothermal area sits within an area known as the Aurora-Bodie volcanic field. The Bodie Hills are located to the west while the Wassuk Range is located to the east. The rocks in this region are composed of Calc-alkaline andesite, dacite and trachyandesite lavas, breccias and ashflow tuffs, deposited between 15 and 8 million years ago. These units are overlain by a series of younger alkaline-calcic cinder cone deposits and flows. Aurora Crater, located approximately 6 km southwest of the Aurora Crater geothermal area, is a 250,000 year old breached crater surrounded by lava flows. This region has been abundantly cut by faults and covered in ash from more recent eruptions from the Mono Craters to the southwest (Geologic Points of Interest by Activity – Volcanic Activity).

Gold and silver deposits found in Miocene volcanic rocks were mined in both Bodie (CA) and Aurora (NV) until the 1950s (Geologic Points of Interest by Activity – Volcanic Activity). The Aurora District was the most productive mining district in Mineral County. Between 1861 and 1869, nearly $29,500,000 in gold and silver were produced from the Aurora mines (Ross, 1961).

Geothermal features:

A blind geothermal anomaly is reported between Aurora Crater and the Borealis open-pit gold mine 12 km northeast (Richards and Blackwell, 2002). The Aurora prospect consists of 29,000 acres in an area of Quaternary basaltic volcanism. Seventeen temperature gradient wells indicate a large geothermal anomaly. One temperature-gradient well, drilled by Phillips Petroleum Company northeast of Aurora Crater, has a reported temperature of 109ºC at 229 m (GeothermEx, 2004). Location: 38.35ºN, 118.82ºW.

Water samples, on the other hand, do not pick up the geothermal signal. NBMG field workers measured three springs on the northwestern and northeastern flanks of Aurora Crater, including Mud Spring (Great Basin Groundwater Geochemical Database). Spring temperatures ranged from 12.5 to 15.5ºC, and geothermometers fell in a tight distribution of 64 ± 4ºC (Ca-Na-K; Fournier, 1981) and 80 ± 9ºC (chalcedony; Fournier, 1981).

A notably alkaline spring (pH 9.15; 15.1°C) was sampled in Alkali Valley southeast of Aurora Crater (Great Basin Groundwater Geochemical Database). The 4 x 10 m pond is situated between basaltic hills to the south, bedded rhyolite to the northwest, and a borate playa to the north. The site has periodic sulfur outgassing and orange algal mats. The upwelling source could not be located though, and sample charge balance was poor (19.3%). The resulting geothermometer calculations are unreliable at 132.9°C (Na-K-Ca-Mg) and 82.5°C (chalcedony). Location coordinates are 118.75281 W, 38.26198 N (NAD83) (Great Basin Groundwater Geochemical Database).

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Leasing information:

Gradient Resources reports that their Aurora geothermal leases are in advanced development. A GeoVision technology survey identifying thermal anomalies was completed recently on the property. Gradient reported an estimated 132 MW resource at Aurora (Current Geothermal Projects/Exploration Activity); however, as of spring 2014, no work had been completed at Aurora as Gradient focused their efforts on development of their Patua project.

Bibliography:

Current Geothermal Projects/Exploration Activity, Nevada Bureau of Mines and Geology http://www.nbmg.unr.edu/Geothermal/Projects&Exploration.html, accessed July 6, 2015

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Geologic Points of Interest by Activity – Volcanic Activity, USDA Forest Service, Intermountain Region, 2008, http://www.fs.usda.gov/detail/r4/learning/nature-science/?cid=fsbdev3_015974#ht, accessed July 6, 2015.

GeothermEx, Inc., 2004, New geothermal site identification and qualification: Report prepared by GeothermEx, Inc., Richmond, CA, for the California Energy Commission under the Public Interest Energy Research (PIER) Program, Final Project Report 500-04-051 http://www.energy.ca.gov/pier/project_reports/500-04-051.html.

Great Basin Groundwater Geochemical Database, Nevada Bureau of Mines and Geology: http://www.nbmg.unr.edu/Geothermal/GeochemDatabase.html.

Richards, M. and Blackwell, D., 2002, The Forgotten Ones: Geothermal roads less traveled in Nevada, Geothermal Bulletin, v. 31 (2), p. 69-75.

Ross, D.C., 1961, Geology and Mineral Deposits of Mineral County, Nevada: Nevada Bureau of Mines and Geology Bulletin No. 58.