CANYON BLOOMERS
(Formerly M & L Greenhouses)
Hagerman, Idaho

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Geo-Heat Center

LOCATION

These greenhouses are located along the Snake River, approximately 30 miles northwest of Twin Falls, Idaho and near the town of Hagerman. There are also several more greenhouse operations, a catfish/tilapia/alligator farm, hot springs spa/resorts and residential heating within about three miles in either direction along the river. Elevation is about 3800 ft ASL and average annual temperature about 50°F.

RESOURCES

The resource is known as the Banbury Hot Springs area. Most of the wells are in an area about 10 miles long by one mile wide. The occurrence of thermal water in the area appears to be fault controlled. The better (higher flow and temperature) wells occur on the down-throw side of the fault. Temperatures range from 77 to 162°F. Water quality is generally good–pH 7.9 - 9.5, total dissolved solids 230 - 420 mg/l with higher temperature fluids having higher pH and TDS. Artesian heads range from slightly above, to 360 ft above, land surface. Based on heat flow data, depth of circulation to attain the highest temperatures in the wells is about 4400 ft and since most wells are only 420 - 700 ft deep, convective transport along faults is indicated. Probable maximum temperature based on geothermometers is about 195°F.

Canyon Bloomers utilizes two wells, one 505 ft deep will produce about 400 gpm at 107°F; the other 1,000 ft deep produces about 250 gpm at 130°F.

UTILIZATION

M & L Greenhouses started operation in 1970 with one greenhouse using propane and electricity for heating. In 1974, the 107°F well was drilled and the greenhouse converted to geothermal. Currently, there are 20 houses of 5,000 sq ft each (2.3 acres). Geothermal at 130°F is used in fan coil units, then cascaded to radiant floors in 16 of the houses. The remaining four use water cascaded from the 16 in their radiant floors. Water is also cascaded to radiant floors in the large office and shop, and to a swimming pool. Three houses have table top heating using 107°F water and the owners residence uses mostly 107°F water in radiant floors, but can be switched to 130°F water if needed. Total peak flow is 450 gpm providing an estimated installed capacity of 1.9 MWt. Annual energy use is estimated at 14.3 x 10^9 Btu/yr.

Canyon Bloomers is a contract grower supplying 2,000 varieties of annual spring plants to large retailers. Their growing season starts about mid-December and finishes in late-June.

OPERATING COST

Operating costs for the geothermal system is minimal; since, the wells have an artesian head. Wellhead pressure in the shallower 107°F well varies from 60 psi down to 20 psi at peak flow. A booster pump is required only when wellhead pressure is down near 20 psi. The other well is not pumped. Fan coil units last about 15 years and cost about $2,600. The black steel piping has had no problems. "Sometimes weak acid is run, through the pipes to clean them," the owner reported.

REGULATORY/ENVIRONMENTAL ISSUES

During the late-1970s and early-1980s, there was a large increase in the number of wells in the area. As a result, artesian heads and flows decreased. The Idaho Water

Resources Department instituted a "Ground Water Management Area" in 1983 meaning that no new commercial well water rights will be issued.

There have been concerns voiced about geothermal uses thermally polluting the Snake River. Most of the users discharge relatively cool effluent so nothing has come of the concerns to date.

PROBLEMS AND SOLUTIONS

Aside from the artesian head loss, there have been no major problems. Very early on, it was learned that copper piping rapidly corroded and galvanized piping tended to scale and plug, but since the operation was small, the conversion to black iron was fairly easy and inexpensive.

CONCLUSIONS

This operation demonstrates the feasibility of utilizing very low temperature geothermal resources. Several of the greenhouses, the residence, shop and office are heated by 107°F geothermal water. The operation started small and grew as the owner learned greenhousing and geothermal, and was not afraid to try using the lower than normal temperatures.