Figure 7. Major-ion composition of water sampled from the Colorado flow system

sured at sites in discharge areas of the regional flow system or near faults.

Deeply circulated ground water that obtains elevated temperatures generally has higher concentrations of dissolved solids because the solubility of many minerals in the aquifer, such as chloride and silica, is increased with temperature. Arsenic, boron, and lithium concentrations in geothermal water also increase due to leaching of the host rock. A poor correlation exists between water temperature and the concentration of these constituents in water sampled as part of this study (fig. 9) indicating that geothermal heating is not the main cause for

increases in concentrations of these elements, but that heating during the deep circulation of water may have some minor effects on concentration〔≡〕ulations of low (<250°C) reservoir temperatures using chemical solubility equations developed by Fournier (1981) and Kharaka and Mariner (1989) for geothermal systems indicate that maximum reservoir temperatures could not have been greater than 140°C and probably were less. These low reservoir temperatures indicate that deep circulation along relatively normal geothermal gradients is more important than heating in a geothermal reservoir. This is consistent with the evaluation made by Garside (1994) who

EXPLANATION
Sample sites
● Trough
◆ Wilkens
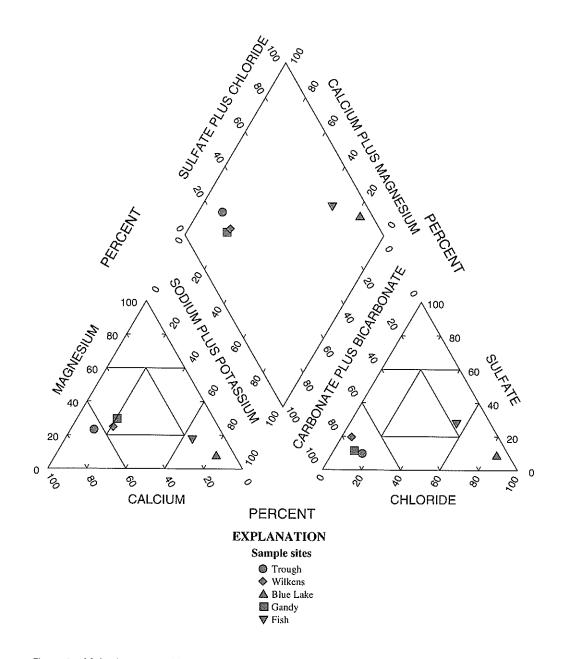▲ Blue Lake
▨ Gandy
▽ Fish

Figure 8. Major-ion composition of water sampled from the Great Salt Lake Desert flow system

suggested that the low- to moderate-temperature geothermal resources in east-central and southern Nevada are related to regional deep circulation of ground water in the fractured carbonate-rock aquifer, and not to high geothermal gradients. Garside (1994) also concluded that maximum reservoir temperatures were less than 100°C in these areas.

Arsenic values for water from the 30 sampled sites range from 0.7 to 45.7 µg/L, with a median value of 9.6 µg/L. The MCL for arsenic is 10 µg/L (U.S. Environmental Protection Agency, 2002b). Factors affecting arsenic concentration in the carbonate-rock aquifer, in addition to geothermal heating, are its natural occurrence in the aquifer material and time of travel

along the flow path. Arsenic concentrations in water sampled from the 10 sites in the Colorado flow system range from 1.8 to 45.7 µg/L (fig. 10) and 8 of the 10 samples exceeded the MCL. Generally, lower arsenic concentrations are in the northern part of the flow system closer to the recharge areas, although recharge does occur all along the flow system. Ground-water flow generally is towards the south and arsenic concentrations tend to increase in that flow direction.

Arsenic concentrations in other flow systems are relatively low, generally less than 10 µg/L. The exception is the one well sampled in the Humboldt flow system that reported an arsenic concentration of 20.3 µg/L.