

MEMORANDUM

December 18, 2003

To: Jim Zokan

Through: Garth Newton

From: Shane Bendixsen

Subject: Transfer 70750, Raft River

It is my understanding the applicant wishes to transfer part of his ground water right approximately 4,000 feet to the northwest (see the Attached figure). Reason for the transfer is the current well produces water too hot for irrigation. The new well hopefully produce water of a lower temperature and the mixing of the water from the two wells will be suitable agricultural use.

Non-geothermal well water temperature is usually 55 to 60 degrees F. Temperature in the Raft River Geothermal aquifer can be greater than 150 degrees F. Water in the bottom of the existing well was 111 degrees F when drilled in 1950. This suggests some type of mixing between the cold and geothermal systems. The question is whether the mixing is just temperature or geothermal water leaking upwards.

The Raft River Geothermal area was developed in the late 1970's, but it was determined to be not economic and has since not been active. The development did produce several studies that do provide an understanding of the system. Spencer and others (1979), describe the deep geothermal water as leaking upward into the cooler regional system. This was based on water quality data from the shallower irrigation wells in the area. The total dissolved solids averaged approximately 650 mg/l. The deep geothermal system has TDS ranging from 1600 to 6330 mg/l. Surface water in the basin usually has a TDS less than 150 mg/l (Walker and others, 1970). The surface water recharges the cooler regional aquifer. Obviously the deep geothermal waters are leaking upwards into the cooler regional system.

As a further check more recent water quality data from the regional system is shown on the attached figure. The TDS ranges from 787 to 919 mg/l.

The flow from the geothermal waters upward into the regional system is probably saturated, but data are not available to confirm this. Therefore pumping from one system will probably affect the other.

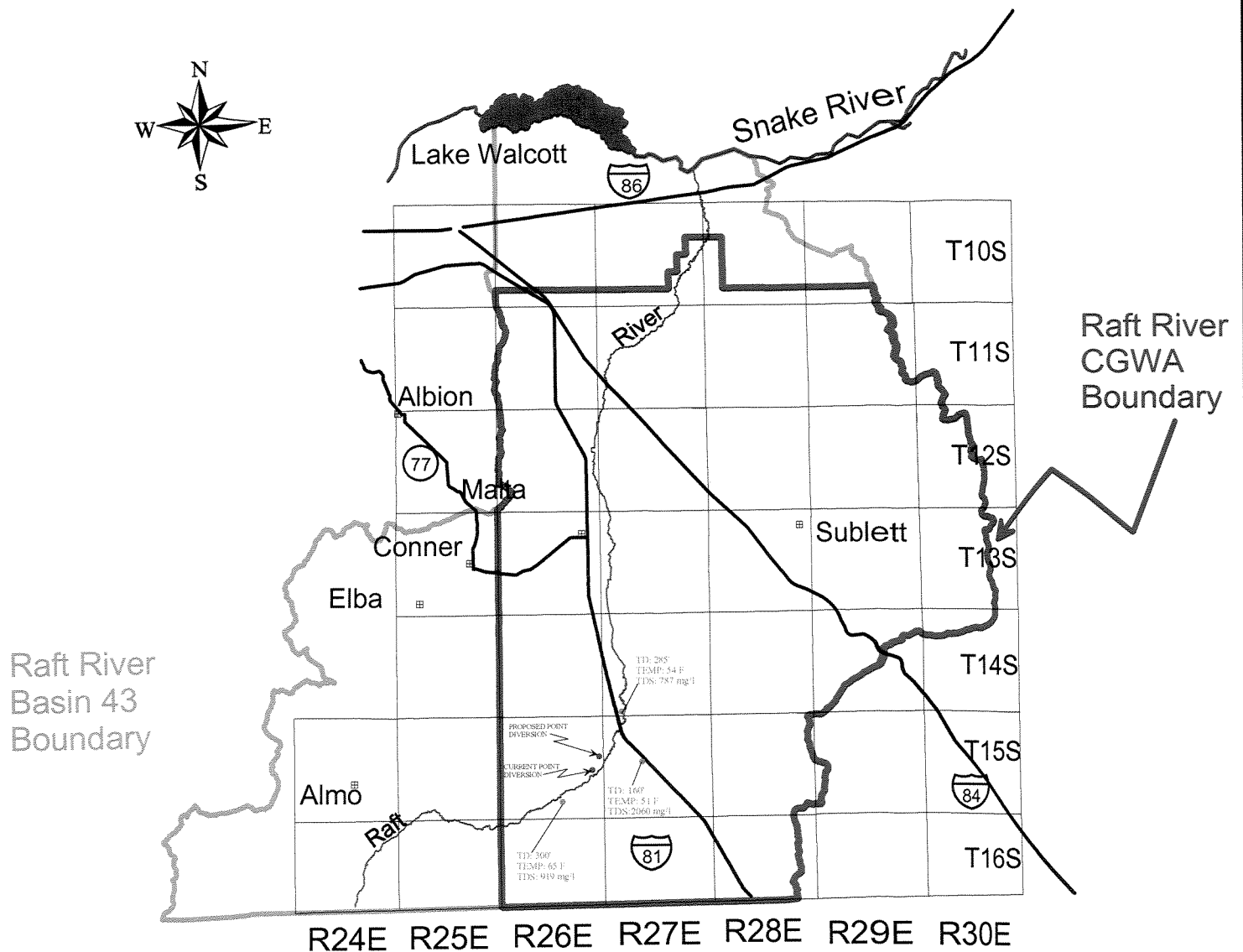
How much water is leaking into the regional system is not known. It would take some type of a numeric model to determine this and even then the accuracy would be questionable.

REFERENCES

Spencer, G. S., Russell, B.F, and Sullivan, J.F, Potential use of Geothermal Resources in the Snake River Basin: An Environmental Overview, Prepared by EG&G Idaho, Inc. for the Department of Energy, September, 1979.

Walker, E.H. and others, The Raft River Basin , Idaho-Utah, as of 1966 — a Reappraisal of Water Resources and Effects of Ground Water Development: Idaho Department of Water Resources Water Information Bulletin 19, 1970.

RAFT RIVER CRITICAL GROUND WATER AREA



• WATER QUALITY STATION
TDS: TOTAL DISSOLVED SOLIDS
TD: TOTAL DEPTH