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MEMORANDUM

SUBJECT: Preliminary Hydrogeochemistry Alkali DATE: July 27, 1984  
Flat Area - Mineral & Nye Counties, Nevada

TO: H. J. Olson

cc: J. E. Deymonaz  
J. Fonseca  
W. Lodder

FROM: H. D. Pilkington ✓

The Alkali Flats area is located approximately twenty (20) miles northwest of Gabbs, Nevada (Fig. 1) in Mineral and Nye Counties. The area is a closed basin bounded by the Monte Christo Mountains on the east and by Gabbs Valley Range on the south and west. The area had been covered in a cursory way during the 1977 and 1978 "Recce" programs. Therefore, the area was covered during the 1984 "Recce" program. Julia Fonseca located the Mt. Anna hot well approximately six (6) miles north of Wedell Hot Springs (Fig. 1). On June 19, 1984, Fonseca and Pilkington probed the well. At ninety meters the well became isothermal at 82.5°C. The thermal gradient in air above the water table is approximately 69°C/Km. Mt. Anna Hot well is located in Sec. 17 T13N, R34E and was drilled by the BLM as project 236. The well is reported to have been drilled to a depth of 600 feet; however, according to the BLM, when the last grazing permittee applied for water rights, the well depth was found to be 300 plus feet.

Julia Fonseca located the rancher who has the water rights for the well, and on July 10, 1984 arranged for a pump to be taken to the well and obtained a water sample (Table 1). The chemistry of the Wedell Hot Spring and Gabbs Valley Ranch system well are also shown in Table I.

The chemical geothermometers for the Wedell Hot Springs and Gabbs Valley Ranch well suggest the silica geothermometer which should be used is that for chalcedony. Then the Hot Spring sample shows good agreement for  $TcSiO_2$  and  $TNa-K-Ca$  at 137 and 138°, respectively. The Gabbs Valley Ranch well has  $TcSiO_2$  of 101° and  $TNa-K-Ca$  at 142°. The alkali geothermometer agree well and the lower silica geothermometer value can be explained by cold water mixing. Mt. Anna Hot Well alkali geothermometers fall right in there at 142C; however, the silica geothermometers come in quite low. The low silica values from the Mt. Anna Hot Well may be in part explained by cold water mixing, but may also be related to silica precipitation due to  $CO_2$  loss.

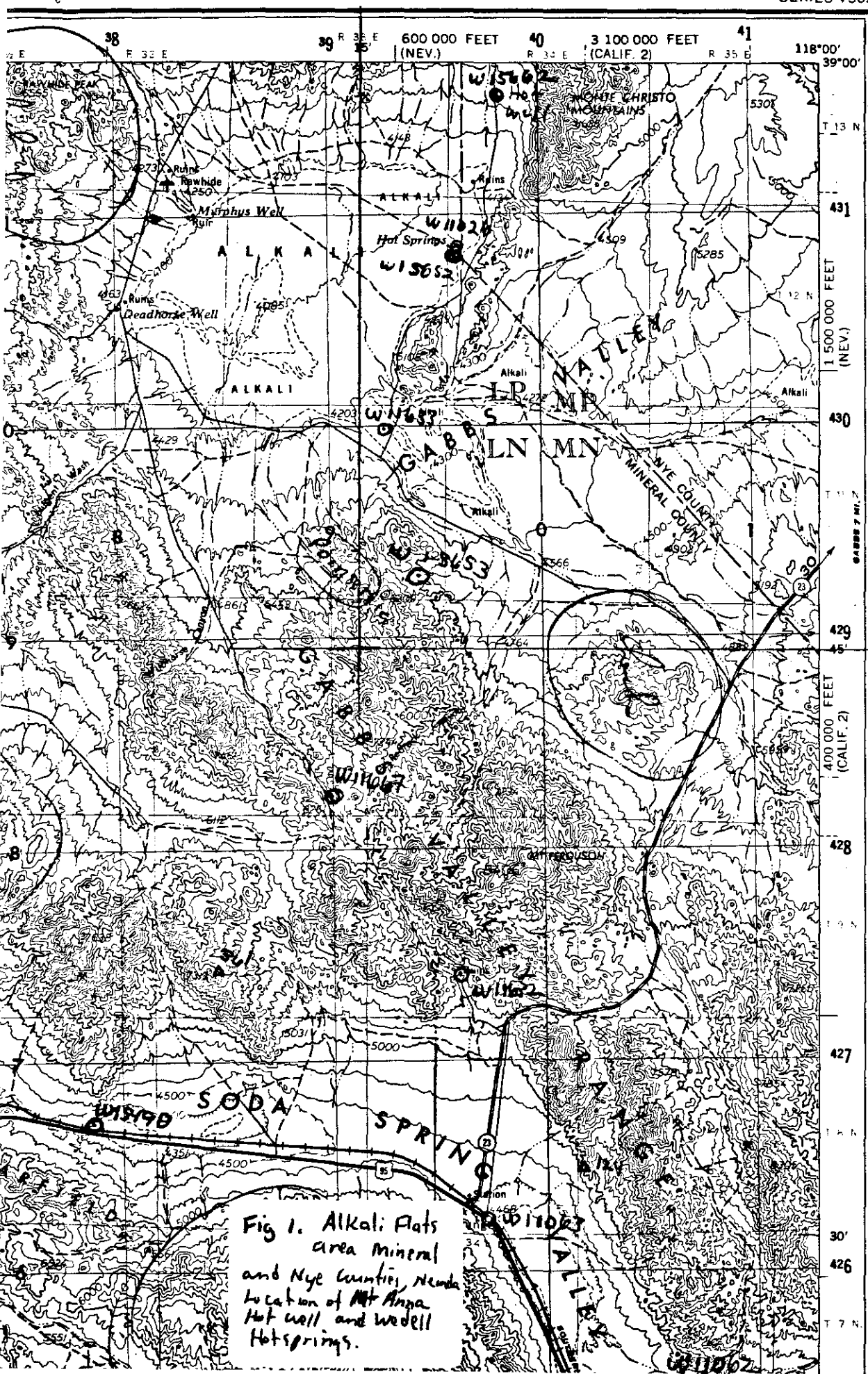


Fig 1. Alkali Flats  
area Mineral  
and Nye Counties, Nevada  
Location of Mt Anna  
Hot well and we'll  
Hot springs.

The sodium-sulfate-bicarbonate waters are typical of moderately deep circulation along basin and range faults in Nevada. It does not appear that the circulation has been deep enough to provide for temperatures needed for power generation

Table I.

Water Chemistry for Samples Collected in the  
Alkali Flat Area, Mineral & Nye Counties, Nevada

	W11026 Wedell Hot Spring Sec. F T12NR33E	W11633 Gabbs Valley Ranch Well Sec. 2 T11NR33E	W15662 Mt. Anna Hot Well Sec. 17 T13NR34E
Temp. °C.	54	22	82.5
Flow (gpm)	25	1200	7
pH	8.12	7.99	NA
Cl	74.0	48.0	NA
F	12.0	4.0	NA
SO <sub>4</sub>	320.0	550.0	NA
HCO <sub>3</sub>	177.6	106.0	NA
CO <sub>3</sub>	0.0	0.0	NA
SiO <sub>2</sub>	150.0	85.0	55.2
Na	260.0	320.0	106.0
K	8.5	14.0	4.1
Ca	10.0	55.0	2.8
Mg	0.4	6.0	0.14
Li	0.0	0.5	0.32
B	1.1	1.1	0.40
TDS	1013.6	1189.6	--
Ec(K)	--	--	NA
TqSiO <sub>2</sub>	161	128	107
TcSiO <sub>2</sub>	137	101	77
TNa-K	189	155	147
TNa-K-Ca	138	142	142
TNa/Li	--	102	147
TLi	--	131	118

/m

